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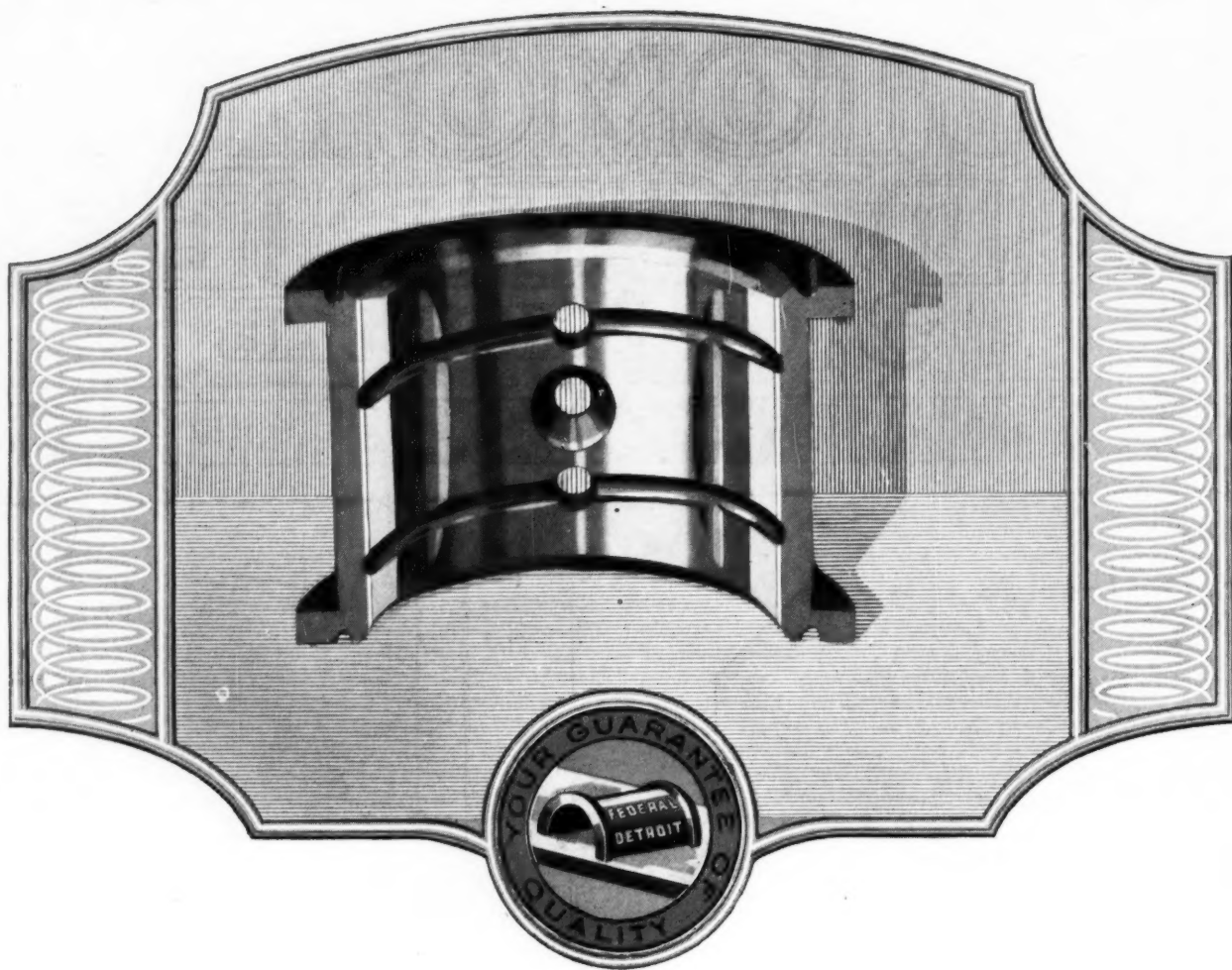
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No. 1

Body Builders Are Eager to Give Best Service Possible

Cooperative program agreed upon at Detroit convention of A. B. B. A. Committee named to work out standard guarantee. Members alive to new problems which confront them. Body declared most important part of car. Will hold no 1923 show.

By James Dalton

SERVICE, in the broadest sense, to the automobile manufacturer, to the motor vehicle user and to each other, was the dominating note throughout the sessions of the Automobile Body Builders' Association, which held its summer meeting in Detroit last week.

It was agreed that the responsibility of the body manufacturer does not end when his products are delivered to the automobile maker. Recognition of this responsibility was evidenced, primarily, by the adoption of a cooperative service plan and by the appointment of a committee which will work out some form of standard guarantee.

Another step in the direction of real service was the decision of the paint and varnish section of the association to initiate a campaign of education designed to teach owners and garage men proper methods of caring for the finish of automobiles.

It was conceded that the most difficult phase of service is the paint and varnish question. This is the weak link in the chain, and body manufacturers are studying eagerly the efforts of paint manufacturers to produce at a lower price a more durable and more fool-proof finish which can be applied more rapidly and yet give better results. It was agreed, however, that the best possible use is being made of the materials available and that it is up to the paint chemists

to find something which will replace the present finish.

Members of the association are fully alive to the new problems which have come with the amazing advances of the automotive industry as a whole. Opportunities for profit have multiplied no more rapidly than the complexities of production under new conditions. The major part of the burden brought by the rapid shifting of demand from open to closed cars must be borne by the body manufacturer. The chassis is the same for either type.

Except for those automobile companies which make their own bodies, it is the body builder who must revamp his factory and revise his entire program. He must buy new machinery both for wood and metal working, he must consider new factors of cost, and he must train workers to meet his needs.

DELAYS in deliveries have not been altogether the fault of the body builder. The car makers have been uncertain about the permanency of demand for closed models, they have not known exactly what proportion of open cars to turn out and they have been moving cautiously in production on general principles, because of somewhat uncertain economic conditions. As a consequence they have delayed until the last possible moment the actual placing of orders for bodies and they have made many eleventh hour

changes in design. The body builder has not been able to accomplish miracles and the whole trend has been toward delay.

There is no feeling, however, that there is any actual shortage of body building capacity. While the largest producers, most of them in the Detroit territory, are not members of the association, it does include on its roster the names of most of the other body makers of the country. There are comparatively few of them who could not take on some additional business if they were



F. D. Willoughby, Willoughby Co., president
Automobile Body Builders
Association

Floyd M. Gullison, sales
manager Plymouth Car-
riage Works

given a reasonable length of time in which to put the jobs through their shops. Production delays might be minimized, therefore, if full advantage were taken of the building facilities now available.

Customs and methods of the buggy and coach building days have been practically eliminated from the body branch of the industry. It is conceded that relatively few plants have reached the maximum of efficiency, but rapid progress is being made in that direction. There were no fossils among the men who attended the Detroit meeting. They know that they are living in a new era which requires new methods and new ideas. They are earnest students and they are mopping up information as fast as it becomes available.

Change in Body Design Costly

Production methods cannot be identical, however, in the moderate sized plants and in those huge factories which are installing the conveyor system for assembly. It was contended, however, that those car manufacturers who are eager for more rapid deliveries of bodies could go far in this direction if they would change their body lines less frequently.

Not only would speed of production be enhanced by greater standardization of bodies, but costs would be reduced. It was asserted at the meeting that there is no reason why the cost of an open and a closed body should not be practically the same, except for a little more material and a little more labor, if frequent changes in design are eliminated. Every important change in a body means higher manufacturing costs for the producer, because he has to equip himself to make them.

Most of the members of the association are convinced there is nothing ephemeral in the present enormous demand for closed cars. They believe that in the near future not more than 20 per cent of the cars made will be open models. The only marked difference of opinion is in regard to the length of time which will be required

to reach the 80-20 proportion. Some builders contend that the farmer always will insist upon having an open car, while others believe he will be just as eager as his city brother to drive a sedan or a coupe.

There is a feeling that metal will be used in steadily increasing volume in the manufacture of bodies, especially of the closed type. Wood will be highly important for a long time to come, however, and serious consideration is being given to the elimination of waste. Much interest was displayed for this reason in an address by Prof. A. T. Upson of the Forest Products Laboratory at Madison, who outlined the work of standardization which he has undertaken in cooperation with the Society of Automotive Engineers.

This work includes conservation methods, particularly by shipping in cut sizes. One large source of waste is in the large amount of lumber rejected at the plant. It is felt that much of this loss can be avoided by standardization of lumber gradings.

Keen Interest in Standardization

The entire subject of standardization is one of deep interest to body manufacturers. It includes particularly body hardware, especially locks, splicer plates, hinges and other articles which are made in great variety and in which there are wide variations in dimensions.

While the subject of knocked down bodies was not considered formally at the convention it is being given serious consideration because of the possibility of very sharp economies in freight bills. Elimination of waste in glass, leather, cloth and other materials all are being given close attention. Members eagerly exchanged experiences on these subjects.

Cost accounting is another subject which is being studied carefully. It is realized that with the coming of new conditions, body producers must give greater attention to cost considerations which have been regarded as comparatively trivial in the past. In a period of exceedingly keen competition efficient production methods may determine the difference between a profit and a loss and they may influence an estimate which will bring an order. For this reason the members followed with close attention an address by E. J. Thompson, president of E. J. Thompson Co. of Pittsburgh, a former president of the association, who has studied the cost question very carefully.

Body builders propose to urge so far as possible larger commitments, which will permit longer runs through their shops. Thompson outlined how rapidly unit costs may be increased when a plant is given small runs instead of continued production. It was contended at the convention that if the car manufacturer whose volume is small is to compete successfully with the larger companies, he must take advantage of all the economies possible in the body factory. Consequently he will have to make his commitments as long as possible. It is impossible to give as good a price on a small as on a long run.

Members of the association are not willing to admit that their factory methods are as archaic as some of the car manufacturers seem to think them. This view on the part of automobile builders was brought out by R. C. Getsinger, former sales manager of the Lincoln Motor Car Co., who is now a body builder. His information in this respect was based on replies to a questionnaire sent to automobile manufacturers asking them what body makers could do to increase their efficiency.

Getsinger declared with emphasis that body building has at last come into its own and that the body is the most important part of a car. He cited actual examples of companies which have scored great successes by fea-

turing bodies rather than chassis in their advertising. The average car buyer knows little about mechanical details, Getsinger said, and takes it for granted that the mechanism will be entirely satisfactory. He cares a great deal, however, about the appearance of his car, and appearance is governed almost entirely by the body.

While car owners are intensely interested in getting a good-looking body it seems never to occur to them that a body needs servicing of any kind except washing, and that usually is done in such a way that it destroys the finish. Generally speaking, no attention is paid to body service, and when anything goes wrong the body manufacturer is blamed, no matter how long the car may have been in service and regardless of the kind of usage it has been given. This attitude seems to be reflected somewhat by the car builder and to a greater extent by the dealer who sells the automobile.

Plan Educational Campaign

It was felt that no one needs education in this respect more than the dealer, and the service committee of the association will give consideration to the preparation of literature which will instruct the owner and the dealer.

Body builders feel that too much often is expected of them in the way of service and that their perfectly good workmanship frequently is blamed when defects develop as the result of faulty designs which they were directed to follow. They were a unit in declaring, nevertheless, that they will gladly go the limit in backing up their products. The helpful spirit of cooperation displayed in this respect was shown in the following resolution adopted by the passenger body section:

"WHEREAS the builders of passenger bodies are often required to furnish service repairs for such bodies at a distance from their factory plants, thereby necessitating long trips by service men and in many cases unnecessary expense;

"AND WHEREAS it is the purpose of the Automobile Body Builders Association to assist its members so far as possible in their various industries;

"NOW THEREFORE be it resolved that we, the members of the Passenger Body Group of the Automobile Body Builders Association, do hereby severally agree that on receipt of request from another member of this group, we will furnish to the member making such request a complete report on any claim for service upon bodies when, or at such time as such bodies are delivered at our respective plants for inspection: That such inspection and report on same shall be made without charge.

"That after such inspection has been made it shall

be found that repair service is required that such repairs shall be made on request of original builder of said bodies at actual cost of labor, overhead and the material.

"Be it further resolved that this agreement shall apply only to bodies in the possession of actual users and that this agreement shall become effective beginning July 1, 1923, and remain in force for the period of one year."

The standing committee appointed by President F. D. Willoughby to work out some satisfactory form of service guarantee which will be comparable to the 90-day standard guarantee given by automobile manufacturers, is composed of A. R. Guider of Detroit, E. Schebera, Fleetwood, Pa.; Thomas Bracken, New Haven, Conn.; E. H. Wilson, Moline, Ill., and James Daugherty of Indianapolis.

This committee will be interlocking with the service committee, which is composed of Wilson, Daugherty and E. J. Thompson.

While the A. B. B. A. is one of the youngest organizations in the automotive field it promises to be one of the most successful as well as one of the most useful to its members in the consideration of common problems. There has been a very rapid increase in membership in the past year and more were obtained at the convention.

Divisions to Be Regrouped

Because of the diversity of interest and the varying problems involved, it has been deemed advisable to divide the membership into groups for consideration of questions in which they are especially interested. The groups set up for the Detroit convention, which are subject to revision and better grouping before the next meeting, together with their chairmen, were:

Passenger body, H. H. Seaman; bus body, F. M. Cullison; commercial body, A. W. Frantz; upholstery fabric, C. S. de Got; body hardware, W. H. Ritter; paint and varnish, L. B. Valentine; decorative hardware, M. F. McFarland; coated material, R. Johannesson; windshield and glass, M. S. Bottume; structural material, H. A. Singer; leather, Julian Hatton, and mill supplies, C. G. Odell.

It is probable, for example, that the bus and commercial body makers may be combined in one group, and it is certain that the body hardware, decorative hardware and glass and windshield sections will be consolidated.

Section meetings for the discussion of questions of peculiar interest to the members will be held as frequently as possible without reference to the other divisions of the association.



R. R. Paradies, Beckwith-Chandler Co.

H. A. Singer, president Arkla Lumber & Mfg. Co.

H. H. Seaman, Seaman Body Corp.



R. C. Getsinger, Getsinger-Fox Co.

Ernst Schebera, vice-president Fleetwood Metal Body Co.

L. B. Valentine, vice-president Valentine & Co.

Bodies Have Become Most Important Factor in Making Sales

Getsinger declares trend is constantly toward better work. Questionnaire discloses that some car manufacturers believe production methods have not kept pace with chassis progress.

ASSERTING that bodies have more than anything else to do with the sale of automobiles, R. C. Getsinger of the Getsinger-Fox Co., former sales manager of the Lincoln Motor Car Co., told the members of the association that their work has become more important than ever before. The trend is constantly toward better bodies. It is impossible to sell cars with poorly designed bodies even if they are mounted on the best chassis in the world.

He gave an interesting digest of the replies to a confidential questionnaire sent manufacturers in which they were asked what body builders could do to improve their service to customers. Most of the car makers seem to feel that the body branch of the industry had not progressed quite as fast as the chassis builders in production methods. It is felt, also, that there is considerable needless waste in body plants and that overhead expense could be reduced considerably.

Getsinger said he did not agree with all of these contentions but passed them along merely to show the views of the car manufacturers who all admit, however, that their relations with body builders are cordial. In his address he said in part:

IT seems to me that there is every reason to feel that this organization should be of similar service to the body builders and allied manufacturers as the National Automobile Chamber of Commerce has been to the automobile and truck manufacturers comprising its membership, and I know from very close personal experience that that organization has been of immeasurable service to its members and has had a great deal to do with the stabilization of the automobile industry and the tremendous strides that industry has made.

Of course the amount of good which an organization can accomplish depends entirely upon how much interest and how much assistance the organization receives from each individual member, and it is in this spirit and not that I enjoy making a talk, that I consented to take part today. As President Willoughby expressed it, coming fresh as I have from many years of association with the automobile industry in a selling capacity, he felt I might give you body builders some of the slants and the frame of mind of your customer, the manufacturer, which would be of value to you, and I agreed also with the further understanding that you were not looking for a display of oratory at these meetings but just plain practical thoughts on the various topics of interest to body builders and allied industries.

Whereas it was formerly a matter of mechanical excellence and the kind of a demonstration that was made that determined the sale of an automobile, the industry has now reached the point where the chassis is accepted as being mechanically O. K.; at least this is true in the case of the larger manufacturers—those who do 85 per cent of the business. This being the case, the sale nowadays is very largely a matter of the design, detail and equipment of the body. This is especially true since the automobile has become the accepted family vehicle, a necessary part of the equipment of every family, and the other members outside of the so-called head of the family have a great deal to say about which car shall be bought.

I have asked this question directly of practically every large manufacturer in the business, and by far the larger number agree that this is true. I do not mean to imply that the chassis is not important, because, of course, any one who builds a poor chassis can stay in the business

only as long as it takes the public to find out that he is cheating, for of course there is no longer any excuse for a poor chassis unless the manufacturer is deliberately cheating the public.

Here is a good illustration of what I mean. There are two or three companies that have built up businesses of enormous volume during the past four or five years strictly on the appeal of body design, equipment and comfort. I have in mind one company in particular. While the public generally is motorwise and takes a keen interest in discussing automobile mechanics, there is not one motorist out of a hundred that could answer half a dozen leading questions about the chassis specifications of the car which I have in mind. Their advertising and sales arguments are based entirely upon design, appearance, comfort, and body equipment. There has never been an ad published by that particular company to my knowledge that mentioned a single mechanical feature. I happen to know that the car in question is a good car and always has been; otherwise, of course, the company could not continue to do an increasing business each year, but there are lots of good cars mechanically that have been in business many more years than the company in question whose volume is but a fraction of the company I have in mind.

Ten years ago a business could not have been built by advertising appearance and body design entirely and not mentioning at all the mechanical features. The first thing a prospective buyer did as late as five years ago was to take a demonstration. The sales negotiations started with that point and nothing could be accomplished until the prospect was gotten successfully by that point. Nowadays the demonstration is a comparatively unimportant incident in the sale and many cars are sold without demonstration.

Bodies Principal Sales Factor

Another illustration. There is another very large company in the industry which came very close to financial disaster a few years ago due to a very poor chassis as well as poor bodies. This company went through a financial reorganization three or four years ago and the first thing they did was to go through the chassis with a fine tooth comb and make the car mechanically what it should be, and then they topped off the job by putting on the chassis what up to that time was the finest looking line of bodies on any cars in the same price class. They then started advertising their beautiful bodies. Wherever men congregate and talk automobiles, which means wherever men congregate at all in this country, and this particular car comes up for discussion, the point is sure to be made very early in the discussion that the Blank car is certainly a very beautiful little car, and on the appeal of appearance and appearance only this company in question has gone from the very bottom of the scale so far as volume of business is concerned, with an exceedingly unsavory reputation, and ridden along to a point in a short two or three years where it is once more one of the ten largest producers in the industry and one of the strongest companies financially. If they had just attempted to tell the public about the mechanical improvements they would not have made nearly the same progress. This same thing practically has happened in one or two other cases. You know who they are as well as I do.

Another sign of this trend toward better designed and more completely equipped bodies is in the great array of deluxe models which have made their appearance during the past year. It is a very incomplete line today that does not include a deluxe closed model or a completely equipped sport car. Starting with Mr. Ford whose base price is \$298 and going up the scale you will find that practically every company has at least one type that is a little better designed, a little more completely equipped which sells

incidentally at a little higher price which they term a deluxe job, and these jobs are being sold in huge quantities.

To go to the opposite side of the argument, I know from close personal experience that it is not possible to sell a line of cars without attractive bodies even if the chassis is the best in the world.

Most Important Branch of Industry

So, in addition to being congratulated because we are in the automobile business, we should also congratulate ourselves upon the fact that we are right now in the most important branch of the automobile business, the end of the business which is receiving by far the most attention on the part of automobile manufacturers, and is of the greatest concern to the automobile dealers and buyers of the country in these days of exceedingly keen competition. I should say that a good body designer or a good body manufacturer right today has about the most desirable bit of service and merchandise for sale in the entire automobile industry. And this is especially true of real body designers. They are mighty scarce.

I have been asked to tell you from my experience in the automobile manufacturing business about the attitude of mind and the viewpoint of the automobile manufacturer toward the body builder. While in the course of the past two years I have had a great deal of contact with a large number of body builders, my contact, nevertheless, has been with those builders who specialize in bodies for the higher priced cars, and since that group is a comparatively small one when considering all the body builders of the country as a whole, I felt possibly what I might have to say on this matter of the viewpoint and attitude of the car manufacturer toward the body builder would be more interesting if it came nearer covering the entire field, rather than a comparatively small group. So I wrote some forty or fifty letters to presidents, general managers, chief engineers, purchasing agents and sales managers of the largest concerns in the business, and also interviewed several other similar officials with this subject in mind—just what is the attitude and viewpoint of the manufacturer toward the body builder and their opinions as to the trend in body building in the future and where should body builders devote their energies in the future to be of most service to their customer.

Well, these replies were very interesting indeed, and the ears of many of you must be burning both from good things as well as the uncomplimentary things said about you by some of your customers. The individuals, of course, who gave me their opinions asked that they should not be quoted, otherwise the information given me in some cases would disclose some of their own plans for the future, and in some other cases their remarks would of course be construed as reflecting upon some of the honorable members of our association; so I am, therefore, going to treat the information very largely in composite form quoting verbatim some of these officials without mentioning any names.

Sound Relations with Car Makers

In the first place, in answer to a very direct question on the subject, practically all agreed that the manufacturer's relations with his body builders indicated to him that the body builders' business is conducted on as high a plane as the businesses of the other suppliers of parts and materials with whom he does business, and the body builders as a whole stand back of their products and give service which is in every way on a par with the service given by the manufacturers of other parts and units.

They all emphasize, of course, the fact that never before in the history of the industry has there been such a pro-

nounced shortage of closed bodies right in the midst of the so-called open car season of the year. As one very prominent manufacturer stated, "The body builders should recognize the trend toward closed bodies and their chief effort should be to turn their men out of their old habits and states of mind into the new habit and state of mind of the days to come when closed bodies will be made in tremendous volume in accordance with modern progressive manufacturing and assembly practices." And still another prominent manufacturer, the president of a very large company, says, "In my opinion the most important place for the body builders of the country to devote their energies is the all important matter of costs and particularly the problem of reducing the differential between open and closed jobs."

Market for Open Cars Will Last

But take courage, you specialists in open bodies, if there are such, for still another, this time a very prominent sales manager, says: "We must not lose sight of the fact that the big market for motor cars during the past two or three years has been in the larger cities—the metropolitan districts. The farmer has not yet begun to buy in proportion to his normal buying power, and it is in the agricultural sections and in the South that the demand for open cars will continue. As long as people are able to buy closed cars, they will use closed cars, excepting in many of the agricultural districts where the car is an all 'round family car, and where produce is piled into the tonneau, taken to the store, and merchandise brought back. There are mighty few farmers who want to put several bags of potatoes in the back of a sedan, when they will do that with a touring car." And from still another sales manager: "I believe that the increasing vogue of long distance touring will continue to mean a much stronger place for the open car than now seems indicated," and from a third along the same lines: "I believe there will always be a certain percentage of open cars sold, but closed cars will unquestionably exceed the open cars in volume and at some near future date we will see open cars ordered as the closed cars were for several years, namely in small quantities."

There is a feeling in the minds of several prominent manufacturers that the body builder has not been as progressive in the matter of manufacturing efficiency and the reduction of costs as has the chassis manufacturer. Several point out that due to the enterprise and progressiveness of the chassis manufacturer, automobiles today are lower in price, dollar for dollar value considered, than ever before in the history of the industry, this in spite of the fact that the trend in labor has been constantly upward, and many of the basic materials which enter into the manufacture of the chassis are double and treble in price over what they were five or six years ago. They cite further that this past year has been one of constantly mounting costs, in spite of which list prices have not been raised to any appreciable extent, and many say that during this same period they have experienced some rather sharp increases in body prices.

Old Time Methods Still in Use

To quote a manufacturer on this point: "We believe that a good many body builders are still operating on old time methods and do not today have the facilities and neither are they sufficiently organized to carry through their manufacturing program on as careful a basis as do the manufacturers of the chassis. Our observations have shown us that there is considerable lost motion and waste overhead expense in most body builders' organizations, and we believe that body builders can best improve their conditions and better serve their customers by getting

their production on a firmer manufacturing basis and devoting more time and energy toward real engineering development of body construction." And from another, this time a prominent production manager: "The average body builder has not made the improvements that have been worked out by the chassis builders. I think this is largely due to the fact that precision instruments, permanent tools and fixtures for body building have not reached the point of perfection that has been reached in the strictly metal working trades. Considerable more hand work is required for body making than chassis making, and while I appreciate that the very nature of the body building will always require more hand work than is required for the chassis, at the same time I think there is considerable more hand work being done on bodies than is necessary." And from a third on this same subject: "Comparatively few body manufacturers have kept pace with the progress of the automobile industry generally. Too many of them have been inclined to adhere to the old carriage builder's program. They have too much in mind the theory of a long profit per unit rather than a reasonable profit on volume."

I am sure that there are a lot of body builders who will take exception to this viewpoint on the part of the car manufacturers, but practically every expression which I received in collecting this information contained some reference to this point and it is, therefore, a matter which is very close to the heart of the car manufacturer, and as such is entitled to most serious thought and consideration, and before we leave this important point I have a suggestion to make.

Ford Practice Worthy of Study

I do not know how many of you strictly body builders have been through the body department of the Ford Motor Company. You know Mr. Ford has a habit of doing things in his own peculiar way regardless of old time habits and traditions, of doing things differently than they have ever been done before. For instance, when he took over the making of his own electric starting and lighting devices, the electrical wizards said he never could do some of the things he was planning to do, one thing in particular, the winding of the armature by machines, but this is exactly what he is doing every day and doing the job better than it has ever been done before. This same thing has been true in practically every case where he has taken over the manufacture of units or materials which had up to that time been considered more or less in the nature of special products which would not lend themselves readily to Ford methods.

But nowhere in the Ford plant is there a better example of doing things in a different way than in the body and top making departments. Every body builder, large or small, should go through these departments of the Ford Company. Even if you build only the highest grade, high priced bodies, you are sure to see something in the course of such a trip that will be of value to you. There is a mistaken idea in many quarters that Mr. Ford builds only cheap stuff. In reality, I doubt if there is any place in the industry where more attention is paid to quality than in his plant. Mr. Ford has become so big and his resources so great that he represents to my mind the final ideal so far as manufacturing equipment is concerned. In other words, all of us would like to do this or that differently if we had the money, would like to tear down this building and build another one a different shape, or tear out this department and set it up differently. Mr. Ford, due to his tremendous resources, is able to do these things and, therefore, as I say, he represents the extreme in manufacturing efficiency, and while of course it would probably not be possible for another body manufacturer to

adopt the tools and methods which Mr. Ford uses, a bunch of body builders going through Mr. Ford's body department could be likened to the old saying that one should "hitch his wagon to a star," and even if he doesn't attain his goal, if he honestly tries, he will be all the better fitted for the niche into which he ultimately settles for having made the fight. Go through Mr. Ford's body department and see how one manufacturer at least has put the production of bodies on exactly the same efficient basis as the production of chassis parts, and even if you can use but a small part of what you have seen there, or none at all, I am sure that everyone who goes through there seriously intending to learn what he may will be a better body builder for having made such a trip. I know enough about Mr. Ford's policies to feel absolutely certain that he would welcome an opportunity to have you shown through his plants.

Another point upon which all the manufacturers seem to be unanimous is the matter of all steel bodies with enameled finishes. It seems to be the consensus of opinion that this will be the ultimate type of body on all jobs of large volume under \$1,000 in list price, and that this form of construction and finish, provided a way can be developed to enamel in colors, will also spread to the medium priced cars and possibly to the higher priced jobs where a reasonably large production is attained.

Practically every manufacturer made some reference to the fact that a very large percentage of the total cost of the body covers the painting and that after these long drawn out and extremely expensive operations the ultimate quality of the paint job cannot be controlled. Many manu-

facturers said that this is the most serious problem that the automobile manufacturer has and one that ultimately must be solved. There seems to be a feeling on the part of everyone that in some way, somewhere, somehow, some one is going to work out a better method of painting.

And still another point which was stressed considerably in the replies I received is that about the only argument most body manufacturers put forth in soliciting business is the argument of price, and then after getting the order he starts to cut the corners to turn out the job within his quotation. Of course it is the purchasing agent's job to get goods of a given quality at the lowest possible price, but please note I said goods of a given quality.

Do not think that these letters which I received contained criticisms only. As I pointed out before, many manufacturers said that the body business is at present on a very high plane and many took the occasion to say some very fine things about the progressiveness and fair treatment they had received from their body builders. And you must bear in mind that although more automobiles are being sold every month than ever before in the history of the industry, that competition is becoming keener and keener and it is becoming increasingly difficult for many manufacturers and especially the smaller ones to sell their products at a profit, so when criticism is invited as in this case, it is usually forthcoming in liberal measure, especially when the subject involved is one of so much importance as bodies. I feel, however, that there is a lot of good meat in the opinions of these customers of yours and that these points are entitled to your most thoughtful and serious consideration.

Small Commitments by Car Builders Tend to Increase Prices

Bodies cannot be built economically in short runs. Design work frequently goes to waste when order is obtained by another bidder. Proper testing of sample bodies saves later trouble.

E. J. THOMPSON, president of the E. J. Thompson Co., body manufacturers of Pittsburgh, spoke on "conservation of practice and control through proper knowledge of cost." He pointed out the impossibility of manufacturing bodies on short runs as economically as when large production schedules were furnished. He showed how the policy of car manufacturers to make small commitments is likely to lead to big differences in price, because the fixed expenses of a plant remain almost constant through a wide range of production.

Thompson also pointed out as one of the evils which exist in the body business the fact that very often manufacturers will be asked to quote prices on bodies and after going through a large amount of design work and the expense of sending traveling men on the road, it will be found that all of this has been wasted because the concern which asked for the bid simply was using the body concern to check up on the quotations of another organization. For this reason, he stated, a concern in the automobile body manufacturing business should cultivate ethical buyers and make certain that the connections made are safe and sound.

It is important to know that the automobile manufacturer supplied by the body builder is using good merchandising methods and has sufficient financial strength to

finance his product. He said that too many body builders have been made the victims of poor business methods on the part of the car manufacturer.

Thompson asserted that while the buying public and even the car manufacturer believe that the profits of the body business are exceedingly large, they are at the present time so small that the body building industry would make no mistake in making known this fact to both buyers and the public.

One of the problems frequently encountered in the body business, according to Thompson, is the question on the part of the customer who buys in 100 lots as to why he cannot obtain the same price as another who buys in lots of 1000 and more.

In a typical plant, Thompson said, the fixed charge per car is obviously much less on a relatively large production and when it is considered that because of the methods it is possible to employ, the unit labor charges, jig, fixture and material charges also go down as the production increases, it is evident that the unit charges on bodies in 5000 lots are going to be materially less than those in lots of 100.

Thompson illustrated this concretely in the case of the four-door sedan where the total selling price to the car manufacturer per body in lots of 100 totalled \$598, figur-



E. J. Thompson, president
E. J. Thompson Co.

A. N. Merrill, Beckwith-
Chandler Co.

ing a 15 per cent profit. Taking this same car in 1000 lots, the saving was over \$200 per body to the car manufacturer, on the same profit basis.

Thompson also touched on the subject of standard

bodies. With proper samples bodies sent over the road and thoroughly tested before production, there is no need for trouble developing later. Proper testing of sample bodies before production will eliminate expensive changes afterward and production should not be started on any other basis.

In a discussion which followed the paper, it was asserted by H. H. Seaman of the Seaman Body Corp., Milwaukee, chairman of the executive committee of the association, that closed body production in quantities is the big problem of the industry. It has placed a handicap on the small manufacturer because it would be too expensive for him to tool up to go into production with designs changing as rapidly as they have in the past. He felt that some car manufacturers want more than can be accomplished for too small an expenditure of money.

There naturally are more "bugs" in specially built bodies, he said, than in those which have become standardized and from which defects have gradually been eliminated. In his opinion car manufacturers should stick to one type of body for their various models and perfect them before jumping to some other design. Bodies and chassis are intimately related but chassis are not always fitted with the right body and the results are unsatisfactory.

Resolutions Advocate Standard Guarantee

Interchange of service and conservation of materials also urged at passenger body section meeting. Methods described for cutting down waste. Twenty-five companies are represented.

RESOLUTIONS urging the adoption of some form of standard guarantee and an interchange of service among members were adopted at the meeting of the passenger body section. There was evident an earnest desire on the part of all the twenty-five companies represented to assist each other in every way possible and to raise the standards of the trade.

Discussion of these subjects followed informal consideration of means for promoting conservation of materials in body construction. Keen interest was manifested in means for cutting down waste of glass, lumber and other materials.

W. C. Fischer of the Baker R. & L. Co. opened the discussion on waste of glass and trimming materials. He said he had observed a tendency to underrate the importance of the waste of materials. Information gathered by him indicates that glass waste ranges from practically nothing to 10 per cent in different plants. A 10 per cent waste means a loss of several dollars on a single body. Glass thickness is another subject to which more attention can be given with profit. Salvage also is important.

Rigid Inspection Customary

A few members contended that unduly arbitrary inspection methods on the part of manufacturers results in rather heavy loss, but there was no general complaint on this score.

One member reported that he was getting glass from Europe at a better price than can be obtained in this country. Few have rejections because of imperfect glass. Most of the companies figure wastage in their charges to their customers, so they have small losses from this source.

The footage used in body construction seemed to vary rather widely. E. J. Thompson said that by the use of saw tooth joints the footage used in an ordinary sedan had been reduced from 400 to 315. This seemed to be the lowest figure.

Service Attitude Defined

The question of service was brought up by E. H. Wilson of the Moline Body Corp. He urged the importance of defining the attitude of the association on this subject. He asked whether it should be that of the department store, which is that the customer always is right, or whether it should be merely to stand behind jobs, repairing or replacing those which are imperfect. He felt that there should be a service arrangement within the membership.

President Willoughby, who was chairman of a committee which made rather a complete inquiry into the service question, contended that there should be a campaign of education from the body builder to the car manufacturer through the dealer to the purchaser. He recommended publication of a carefully compiled service booklet.

He felt that members of the A. B. B. A. should be willing to do service work for other members on the basis of cost of labor, materials and overhead. The feeling that servicing is an individual problem which should not be discussed openly can be eliminated by the right kind of cooperative spirit. The big question, he said, is how much service members are willing to give customers. That is what vehicle makers want body builders to define.

He then brought up the problem of what constitutes a proper guarantee to manufacturers. It might be pos-

sible, he thought, to make body builders responsible for structural defects for a reasonable period, but he doubted whether the same could be true of paint.

It was felt that no charge should be made for service inspection by one member for another.

Wilson, James A. Daugherty of the Robbins Body Corp., Indianapolis, and Thompson were appointed a committee to draft a resolution on the subject of service for presentation to the convention.

It was agreed that in any guarantee which may be decided upon the parts and accessory manufacturers should be included. They have, however, displayed a willingness to replace defective materials.

General employment methods, such as one manufacturer bidding against another for help, together with a maximum and minimum wage, was discussed by W. V. C. Jackson of the Auto Body Co., Lansing. He said that in rush periods some companies, not members of the association, send agents to the employment gates of other companies to lure men away by the promise of higher wages and better working conditions. He held that one company cannot afford to pay more than another if they are engaged in competitive work.

More Trained Men Needed

Some of the members said they were solving the employment problem by breaking in local help. It was felt that men are more likely to stick to their jobs if they are familiar with only one or two operations rather than with a complete job. This does not apply, however, to all kinds of work.

It was felt that a live, husky young fellow, who is something of a mechanic, should be able to earn \$8 for nine hours' work in a body plant. Less skilled men, employed on routine operations, may have to be content with half as much. Promotion for men who display unusual ability is important.

There is exceedingly keen competition for metal finishers. Some of them make from \$18 to \$22 a day, but the usual rate is from \$1.10 to \$1.25 an hour. Several believed that such operations as metal finishing and door hanging should be broken up into several parts. If this is done it is easy to train men for the work.

Help snatching can best be eliminated, it was agreed, by personal conferences with the offending manufacturer. He always is reluctant to admit he had any knowledge of unethical practices.

The only real solution for the employment problem, however, is to train more men, because there are not enough to go round when there is a reasonable degree of activity in the industry.

Cash Discounts Discussed

The subject of cash discounts was brought up by John Judkins of the J. B. Judkins Co., Merrimac, Mass. He did not believe body manufacturers need grant them because they have comparatively few customers and are in a position to watch their credits carefully. He pointed out that there are two schools of thought on the subjects of discounts. One believes that as much as possible should be saved by taking advantage of them, while the other holds that bills should not be discounted at any time for the reason that if they are not, creditors will attach no significance to failure to discount in periods of financial distress.

Standardization of specifications to insure fair competition among body builders was another subject which aroused much interest. Daugherty contended that several body builders might be figuring on the same job without definite instructions from manufacturers and that no two might be working on the same basis.

It is difficult, he explained, to induce automobile manufacturers to work out body designs of their own or even specifications, because a large proportion of the smaller motor car companies have no body engineers of their own. When all bidders are figuring on the same thing, he said, there will be no great difference in the bids. It was his position that body makers should figure their prices with a fair margin of profit and then stand pat on them. No difficulty should be encountered in determining some uniform method of arriving at costs.

H. H. Seaman, who was the temporary chairman of the section, was elected permanent chairman, with Judkins as secretary.

Plans for organization of a joint commercial and bus body group of the association were deferred until a meeting, to be called early in August, at which it is hoped to have large representation from these two fields. These two groups would be organized as a division of the main association and would elect the first vice-president. By obtaining cooperation from truck makers through their dealer organizations the body making business could be placed upon a sounder basis, it was felt.

Body builders in these two fields are seriously affected by the operations of irresponsible builders, many of whom, it was declared, are not legitimately in the body building business at all, and have no capital invested in machinery or shops. They seize upon stray work from time to time to fill in spare time. Recognition from truck makers of the companies who are legitimately in this field and have capital invested in it will result in placing the business with those entitled to it.

Questionnaires will be sent throughout the bus body and truck body field, asking all builders to list the problems in which they are most interested, so that a program can be outlined for the August meeting which they will be urged to attend.

To Teach Care of Body Finish

At the session of the paint and varnish section, which was conducted by L. B. Valentine as chairman, it was decided that the paint and varnish men should compile a booklet to help educate the public on the care of the finish of bodies. It was pointed out that the life of the car finish is materially shortened because of lack of knowledge, not only on the part of the automobile user but the average garage, in taking care of body finish. Valentine stated, in example, that few owners and not many garage men know that soap should never be applied to an automobile body except in solution with water. He also deplored the fact that so many polishes on the market are actually harmful to the varnished



F. F. Murray, Hardwood
Manufacturers Institute

C. G. O'Dell, Black &
Decker Mfg. Co.

surface. It was proposed by the paint and varnish division to enlist the cooperation of car manufacturers in disseminating the information which the paint and varnish section will prepare to help in the campaign of education for the preservation of the finish.

The body and decorative hardware division has under consideration the standardization of certain hardware, particularly lock bolts, lock cases and striker plates. It is hoped by this division to enlist the aid of the hardware men in the industry to cut down the number of sizes and models in these lines.

Progress Made in Grading Lumber Is Outlined by Prof. A. L. Upson

PROF. A. L. UPSON of the Forest Products Laboratory at Madison, Wis., conducted by the Department of Agriculture, told in some detail of the progress made, in cooperation with a committee of the Society of Automotive Engineers, in grading various classes of lumber. G. J. Mercer is chairman of the S. A. E. division on hardwood lumber.

Practical results are being sought by the committee, Upson said. Visits have been made to about forty body and automobile plants to collect data on sizes and consumption of wood by grades and species. There are four classes in automobile body sizes and four types in each class. Complete cutting bills on each class of work have been obtained. The field investigation has been completed, but the analysis of the data has not been finished.

There is little uniformity in the sizes of different parts, even in different bodies, made by the same company.

Upson estimated that maple constitutes 49 per cent of all the lumber used in body building and elm 27 per cent. Ash is recognized as the best material and it is used largely in higher-priced bodies, but it is so expensive that other woods are being used for lower-priced products.



Arthur L. Upson, Forest
Products Laboratory

W. H. Ritter, vice-presi-
dent English & Mersick

It is specified only for closed bodies in the lower price classes.

It has been found, however, that woods which are substituted for ash in automobile work give a high degree of service. The chief difficulty with maple is that it is harder to season, and paint and enamel applied to it wear off somewhat more quickly. It is strong, however, and offers much resistance to shocks. Much oak is used in truck bodies, and if price permitted it could be used to advantage for passenger cars. The same is true of several soft woods.

Upson said the field survey which has been made shows that more efficient utilization is possible in cutting departments. It is possible, for instance, to glue up longer lengths and thereby save waste material. He estimated that the average lumber waste in body plants is from 30 per cent to 40 per cent, although it is as low as 10 per cent in a few. In some others it is as high as 50 per cent.

One point which should be considered in lumber operations, he said, is that wage rates are higher in the larger cities and that greater real estate values keep overhead up. For these reasons he felt that lumber could be cut to best advantage near the point where it originates.

Requirements as to quality are most exacting in relation to sills and pillars. Other parts can be found in the cutting up process and it is possible to use less expensive stock for them. He was confident present cutting waste can be reduced and also that freight bills can be lowered. If relatively cheap woods were used generally for minor parts it would cut down the drain on hardwoods, which are being cut much faster than they are growing.

Upson's outline of what is being done to save lumber was made in connection with the reports of committees. The committee chairmen are: Membership, W. H. Ritter; emblem, E. J. Thompson; standards, E. J. Bartlett; freight rates, Carey F. Quinn; lumber inspection, Charles F. Barndt; show, John Graham.

For the freight rate committee it was reported that there is no intention of attempting to disturb the rate structure until all possible facts and data have been gathered. This work has been undertaken at the request of the carriers themselves. The railroads don't want freight revisions made piecemeal, but all at once, as soon as there is a scientific basis for them.

There probably will be several classifications of bodies with due attention given to the comparative volume of shipments. The committee feels that the carriers have not given sufficient consideration to the economic importance of automobile bodies and that this point should be stressed in rate revision.

Membership Campaign Adds Fifty New Companies to Association List

IN his opening address President F. D. Willoughby of the Willoughby Co., Utica, N. Y., expressed his thanks to the membership committee for its services to the organization in conducting an energetic membership campaign. Nearly fifty new names have been added to the list since Jan. 1. He pointed out that the association has the good-will of the other automotive organizations and is working in close cooperation with them. It has cause to be proud of its progress in establishing this cordial feeling.

Body building has become a great and distinct industry, he said, and it has been demonstrated that it is possible to build perfect bodies at reasonable prices. He urged the need of support for the work of standardization of body parts which has been undertaken in conjunction with the S. A. E. Not only must the standards be agreed upon, but they must be adopted. In his opinion one reason for lack of progress in this direction has been that too much stress has been placed upon relatively trivial parts and not enough upon those which are more important.

Bodies will have more attention in the future than any other part of the automobile, he declared. Chassis design has been perfected to such an extent that it can take care of itself. The A. B. B. A. will focus the atten-

tion of the industry upon the work which must be done.

The industry has entered a great transition stage, Willoughby said. The problem is one of transportation for the individual and the family. The automobile is working potent changes in the advance of civilization. It has broadened the vision of education and economics. Body building has advanced from the coach days until it has become both an art and a science.

The industry is shifting to a new basis which calls for new thought and new planning. The speed of its adjustment will determine the success of individual companies. These new trends will apply the acid test to unsound practices. Builders must intensify their efforts. Each has produced only a portion of what he can produce. In this period of progress there must be cooperative effort. There can be no room for cut-throat methods and misrepresentation. Standardization, which will do so much to promote efficiency, is possible only with cooperation. Such associations as the A. B. B. A. do not aim at restriction of trade, but only at collective thought and mutual helpfulness in the solution of common problems. Conservation of effort and diversification of business can best be accomplished through an association.

Willoughby urged that consideration be given to the adoption of a code of ethics and practices which will demonstrate confidence in the trade and duty to others in the trade.

Observation, he said, implies intensified personal effort and advanced planning as a trade. Few know, he said, where to look for waste and check it. The first step in this direction must be simplification and standardization.

Decision to Abandon Annual Show Meets with Approval of Members

AFTER John Graham of the Holbrook Co., Hudson, N. Y., chairman of the show committee, had explained conditions carefully, it was decided to hold no exhibition this year as an association. He said that F. D. Mitchell, the secretary, who conducted the shows the past two years, had lost money on them and was not willing to undertake the task again.

Experience has shown, Graham declared, that it is not possible to run independently a show which will be satis-

factory to the big exhibitors. The only procedure left, therefore, would be to cooperate with some other organization which had ample resources. Past shows have not been profitable for passenger body builders, but they have been for builders of commercial bodies.

A show which interests only the public and does not bring to it factory body engineers or executives is of no value to makers of bodies. New York, he contended, is the only city which can be considered for a show. There will be four expositions there next season. They will be the closed car show, which will be given in the Grand Central Palace, beginning Sept. 30, by the Automobile Merchants' Association; the importers' display at the Astor; the salon at the Commodore, and the National show of the N. A. C. C.

It would not be possible to get into the N. A. C. C. show, Graham explained, because the position had been taken that allotment of space would conflict with displays by body builders who are members of the Motor and Accessory Manufacturers' Association. The importers' show and the salon were out of the question and this left only the dealers' exposition.

Graham said he had been assured body builders would be given 10,000 sq. ft. of space, or any part of it, on the fourth floor of the Palace if they wished to exhibit. This exposition will be national in its scope, for it will mark the first public showing of several new models, including Cadillac, Packard, Buick, Durant's Eagle, Oldsmobile and Oakland. He intimated that several surprising changes would be made in some of these models.

Members expressed their opinions rather frankly after Graham had made his report. Most of them seemed to feel that they profited little from exhibits at shows. Little business is done and orders which may be taken do not warrant the expense.

When the question came to a vote it was decided unanimously to abandon all show plans for this year. This will not mean, however, the abandonment of the New York meeting of the association during show week, provided the executive committee finds it possible to make the necessary arrangements for a meeting place and can provide a program of sufficient interest. Several members declared it would be profitable to get together in January if only for a frank, informal discussion of common problems such as had been considered at group meetings in Detroit.

Operating Ratios Offer Means to Judge Business Management

A VALUABLE contribution to business science and business literature has been made by J. H. Bliss in his book, "Financial and Operating Ratios in Management," recently published by the Ronald Press, New York. Bliss has taken certain financial and operating facts and developed standard ratios from the relationship of these facts. For example, the relation of surplus net profits to net worth and the relation of costs and expenses to volume of business, etc.

Having established these ratios, Bliss proceeds to interpret them and thus make possible their application as measuring standards in industry. In so doing he offers the managing executive something long desired.

Business is now beginning to be recognized as something dynamic and not static, hence to gauge business progress the managers of industry need a moving picture and not a cross section view. By determining financial and operating ratios each year from the balance sheet and income statement, a means of comparison is offered which enables the measuring of success or failure in management and the presentation of a moving picture.

Accurate knowledge of the progress of a business cannot be obtained from the financial statement of one year alone. The true position of an organization can only be determined by study of statistics over a period of years and by comparison with competitive concerns. The writer brings out this point well.

Bliss divides his book into two parts; the first part shows methods of analyzing financial statements and the second part shows the application of these methods. In connection with the latter there are ten chapters of statistical compilation covering a large number of industries and many concerns within each industry.

Automotive executives will be particularly interested in studying the operating ratios of automobile concerns and comparing these ratios as an industry with ratios of other industries.

It is rare to find a volume which has so much constructive material to offer the executive, accountant, credit manager and student of business science, and it is even more rare to find a book which presents business as a constantly changing, moving picture.

Better to Run Trucks Until Junked Than to Trade for New Vehicles

Members of National Team & Motor Truck Owners' Association believe resale of wornout machines to small operators hurts forwarding business. Fly-by-night haulers a menace. Lack of complete agreement as to advantages of store door delivery.

By David Beecroft

MILWAUKEE, June 27.—President Jos. X. Galvin, at the conclusion of the twenty-first annual convention of the National Team & Motor Truck Owners' Association, expressed the wishes of most of the members present when he said that it is better business to use and maintain motor trucks until such time as they have to be junked than to trade them in to manufacturers on part payment for new trucks. Galvin is general manager of the Pennoyer Merchants Express Co. of Chicago, a large operator of horse and motor vehicles. His statement was prompted by the fact that members of his association in general think used truck trading a very serious evil that is materially injuring the hauling-for-hire business, and that so long as truck operators support the trade-in policy truck manufacturers and dealers sell the partly-worn-out trucks at low figures to small operators who do not know costs and who stay in the business only for a few months and then fail.

Used trucks were discussed more fully than any other question except that of legislation. This association is made up entirely of concerns owning fleets of motor trucks and horse vehicles which do hauling for hire. The association holds a convention each year, which is attended by representatives from local associations in such cities as New York, Chicago, Buffalo, Cleveland, Detroit, Rochester, St. Louis, Cincinnati, Kansas City, Denver, Minneapolis, St. Paul and San Francisco.

The inexperienced, fly-by-night motor truck hauler is a great menace to this group of operators. The irresponsible man is ignorant of how to keep accurate costs and takes business at rates which make it impossible for him to remain in business for any reasonable period of time. The association recognizes the right of every man to engage in whatever line of business he desires, but, at the same time, has to guard against destructive policies.

Members Favor State Regulation

The inexperienced operator is responsible also for the fact that 45 per cent of the motor trucks operated in hauling-for-hire are not adequately fitted with good tires because the operator has not the ready money to keep the equipment in satisfactory operating condition. These worn tires damage not only the equipment but streets and pavements as well.

Regulation of hauling-for-hire by State bodies is favored by many of the members of the association. Carlisle Cameron, president of a large warehouse and transfer organization in Minneapolis, after the experience of the warehousemen in the Northwest under State regulation, is strong for such control. His experience in the

warehouse field goes to show that the warehouse men compiled just rates which are approved by the commission. He believes that if commercial haulers in different States will agree on fair and honest haulage rates State regulatory bodies will approve them, and that such State control will be for the general benefit of the industry. At the present time commercial haulers in the State of Ohio are drafting rates to submit to the Ohio commission.

Overloading One of Greatest Evils

Overloading is admitted by most of the commercial haulers to be one of the greatest evils in the industry, too many members and others hauling 4 tons on a 2-ton truck and 7 tons on a 5-ton truck. The reason back of this is largely rates that are not adequate to take care of the hauling costs. The fact that so many haulers do not set aside a definite amount, perhaps 25 per cent per year for depreciation, is a very large contributing factor in the overloading evil.

Store door delivery, or the organized distribution and collection of merchandise in less-than-carload lots by motor truck, took up as much time at the convention. Frederick C. Horner of the General Motors Corp. gave a very complete presentation of the store door delivery system as carried out by the railroads in London and other British cities, which was followed by a discussion occupying practically an entire afternoon. William H. Lyford, vice-president of the Chicago & Eastern Illinois Railroad, read a paper favoring store door delivery. He believes that one national company should handle collection and distribution of L. C. L. freight in all cities of the country. Lyford is aware of the fact that the railroads of the country are not favorable to such a plan, although he believes it would be beneficial to them as well as to the shipper and the consignees. Under the Lyford plan it would be necessary for all freight packages to carry street addresses, as express packages do today.

Cartage concerns hauling for hire do not all agree that store door delivery would be desirable at present, although some of them are operating on a store door delivery plan, particularly those engaged in forwarding business where they ship carload lots of L. C. L. freight and take care of the collection and distribution of shipments.

President Galvin believes that unless team and truck operators cooperate as they should, a great percentage of this business will pass into the hands of larger organizations, which might be interpreted as meaning organizations formed for handling store door delivery work.

Pilferage, which attains enormous proportions, is presented by some haulers as the principal reason why motor truck and team operators should keep out of the store door delivery field. The New York Central has losses approximating \$5,000,000 a year from L. C. L. freight and the Pennsylvania \$4,600,000. The motor hauler will have to bear his burden of these pilferage losses if his system ties up with that of the railroad, so far as collection and distribution are concerned.

Lyford believes that with the organization of a large concern to handle store door delivery, transportation as a whole will be improved, and while some commercial haulers, operators of motor trucks and horse vehicles might suffer, the complete scope of transportation will gain. Store door delivery would give to the cartage companies a vast amount of haulage which they do not now secure and have not dreamed of getting, so that they should make more money under a unified form than they do at present.

Store Door Delivery Plan for New York

In working out a store door delivery system for New York City, Lyford's plan would embrace having the freight unloaded from the railroad cars on the Jersey shore, loaded on to 5-ton motor trucks, and transported to Manhattan Island and Brooklyn. This would be not only immeasurably quicker than the present system of ferrying freight cars, but would also reduce the amount of costly Manhattan Island trackage on which railroad cars have to be stored. The Erie Railroad is at present operating, to a certain extent, on a store door delivery basis from its Jersey terminal to New York and Brooklyn.

When motor truck haulers engage in store door delivery work, it may be necessary to charge higher rates, as the railroads do, for merchandise of a valuable character upon which pilferage losses are high. There are certain lines of merchandise where a differential of as high as 28 to 30 per cent is charged.

One of the reasons for successful store door delivery in London, England, where it has been in operation since the inception of the railroad, is that the railroad organizations unload freight cars entering London or other cities at night. Coupled with this night unloading is a system of transferable bodies which are loaded between midnight and 7 a. m., so that when drivers of the haulage companies go to work at 7 o'clock the wagons are all loaded and the necessary shipping bills and documents ready. This enables all of the merchandise to be delivered to the consignees by 9 o'clock or thereabouts. In this way, L. C. L. freight entering London gives service which is quicker than express service in America. Such service would not be possible without the unloading of railroad cars and loading of horse vehicles and motor trucks before 7 a. m.

Relieving Terminal Congestion

In London single horse vans or wagons are used principally, and these average three and a half trips per day of 8-hr. duration. Store door delivery is not compulsory in London or other English cities, but it has proved so successful that 80 per cent of all the L. C. L. freight entering and leaving the city is handled in this way.

The wagons making deliveries average sixteen to eighteen stops per delivery; and these same wagons on their collection circuits average approximately the same number of collections.

The great object of store door delivery is to relieve congestion at the railroad terminals, which are the neck of the bottle at present. It has been demonstrated by the Columbia Terminals Co., St. Louis, Mo., that congestion is relieved and larger loads handled in transfer work

between terminals where a unified system is used. This company operates 76 tractors with 225 trailers and in addition has 250 horse wagons. The horse equipment is being replaced as rapidly as possible by the tractor-trailer combination, and in 3 years all the horse vehicles will be replaced.

Horse Interests Show More Activity

Throughout the convention the sentiment was expressed very generally that for city work the horse is going to continue to be used in many fields, although better pavements and problems of congestion are gradually and surely demanding motor transportation. That the horse interests are putting forth the advantages of the horse more than ever before was emphasized by Wayne Dinsmore of the Horse Association of America. In his address before the convention he told of the researches being made by Prof. J. B. Davidson, Iowa State University, to determine more accurately the pulling capacity of horses. Recently a type of wagon has been developed which requires the same effort to pull on a level, up grade or down grade, and with this unusual vehicle a series of tests are to be carried out. To attract more attention to the horse a machine has been developed for use at the Iowa State Fair to test the pulling capacities of different classes of horses.

The Horse Association of America is talking more sanely with regard to the horse than ever before. It is urging the use of the horse for short-haul work, and Dinsmore cited examples of motor trucks being replaced by horses. The examples indicated that trucks of too great a capacity to be profitable had been sold. Irresponsible, inefficient truck installations of this character are reacting against the advancement of the truck industry.

Not only is the Horse Association of America urging the use of the horse for short-haul, but it is urging the use of particular types suited to different kinds of work. For very short-haul, heavy-load work the heaviest type of draft horse is recommended, whereas for longer-haul, lighter-load work, a lighter type of horse appears to be best suited.

Unprofitable Truck Sales Hurt Industry

There is more sanity in the campaign of this horse association than there has been heretofore, and it behooves those engaged in selling motor trucks to use greater discretion in seeing that each truck is well suited to its task. Every sale of an unprofitable truck affords an opening for a counter attack by the horse interests.

An example of how motor truck haulers fail to receive proper return for work done was cited by E. A. H. Baker, hauler, of Denver, Colo. He showed that inter-city haulers will call for merchandise at 6 p. m., make a 75-mile trip overnight, and deliver the merchandise to the retailer the following morning, fully 36 hr. ahead of the schedule that delivery could be made by railroad. The operator could collect for this super-service a sum equal to what the charge would have been had the shipment moved by railroad, plus cartage at each end, but he did not. It will be necessary for the inter-city hauler to make such charges if he is to remain in business and do hauling at a profit. These inter-city haulers are making themselves the goat in their eagerness for business and at the same time are injuring trucking business in general. It is work of this character which breeds contempt of the railroads and suggests radical legislation which the industry will not be able to stand. The solution is that those engaged in such inter-city work must know their costs, otherwise they remain in business for but a short period.

Spark Advance Has Important Effects on Engine Performance

Part I

Study of ignition timing in reference to various combustion phenomena, made at Cornell University, shows need for use of automatic control mechanism operated in correct relation to load and speed. Half of pressure rise should occur at top center.

By George B. Upton*

Professor, Experimental Engineering, Cornell University

IGNITION without timing control is comparable logically to having a carburetor which will produce merely some kind of a mix of fuel and air without trying to make the mixture proportions correct for the load and speed of the engine.

It can be shown experimentally that the timing tolerance within which the spark must occur to get within 10 per cent of the best power and economy of an engine is about ± 20 deg. with a low compression (4 to 1 ratio) engine, and about ± 15 deg. in most engines. No ordinary driver of a car averages this close to proper regulation.

Optimum spark advance can be satisfactorily represented by additive functions, one a matter of speed only, the other of load, or intake manifold depression, only; and hence a simple mechanism can be made to cover both load and speed effects. Optimum spark advance in an engine is a direct measure of volumetric or special flame speed, and a study of the variation of optimum spark advance with load (intake manifold depression) speed, and mixture ratio leads to quantitative numerical evaluation of reaction rate of combustion, of turbulence, of dilution with spent gas, etc.

Research on "explosions" in bombs brings out the following essentials. Explosion-time, or time duration of explosion, is taken as lasting from ignition to time of pressure peak, or to time of maximum pv product if volume is changing. Explosion time is found, in summary, to be:

- (1) Dependent upon mixture ratio, and fuel used;
- (2) Independent of absolute pressure (or density) before ignition;
- (3) Somewhat dependent upon size and shape of explosion chamber, and position of the ignition point;
- (4) Greatly decreased by turbulence of mixture.

The bomb experiments available in the technical literature do not go into the effects on duration of explosion of two other variables, both of importance in an actual engine. These are:

- (5) Dilution of charge with spent gases from previous explosions;
- (6) Temperature of charge just before ignition.

Experiments on an engine show that the maximum power mix for any given condition of speed and load is substantially identical with the mix of minimum value of best spark advance. Any richer or leaner mix than that of maximum power needs more spark advance than the maximum power mix.

Except on a cold engine, however, the extra spark advance for mixtures reasonably near the maximum power mix is small; and this experimental fact makes it possible to eliminate the mixture ratio variable from the general discussion, reverting to it only as a minor factor in a complete solution of the problem of spark advance.

Since time duration of explosion is independent of density of charge, this possible variable disappears. The change of spark advance required from throttling an engine is not a consequence of change of charge density, but of change of dilution with spent gas, and of temperature preceding ignition. A high compression engine, as compared with a similar low compression engine, has a faster explosion not by reason of different density of charge, but by reason of different dilution of charge, and different temperature preceding ignition.

Effects of Dilution Readily Found

The effects of size and shape of combustion chamber, and position of ignition point, and also mechanical and electrical lag in the ignition system, can be taken care of in the case of a given engine by finding a characteristic (imaginary) explosion time for that combustion chamber as a bomb, with the fuel and mixture and temperature used, but without dilution or turbulence effects. The absence of turbulence corresponds, of course, to zero engine speed.

The effects of dilution and turbulence can readily be found by brake tests of an engine over a fair range of combinations of speeds and loads; dilution can be measured from observations of exhaust and intake manifold pressures and temperatures and knowledge of the compression ratio of the engine. The effect of dilution with spent gases is to increase the characteristic explosion time of the combustion chamber by multiplication by a factor fixed by the extent of the dilution.

The effect of turbulence is to decrease the characteristic explosion time by multiplication by a single inverse function of the engine speed. The actual explosion time, from ignition to time of maximum pressure (pressure peak), with the engine warmed up to normal running conditions, can be given as the product of three independent factors: (1) the "characteristic time" of the combustion chamber as a bomb; (2) the dilution factor; (3) the turbulence or speed factor.

The actual explosion time (duration) is simply related to the optimum angle of spark advance and the rotation speed of the engine. If R is the r.p.m. of the engine, its

*Condensed from paper presented at Summer Meeting, Society of Automotive Engineers.

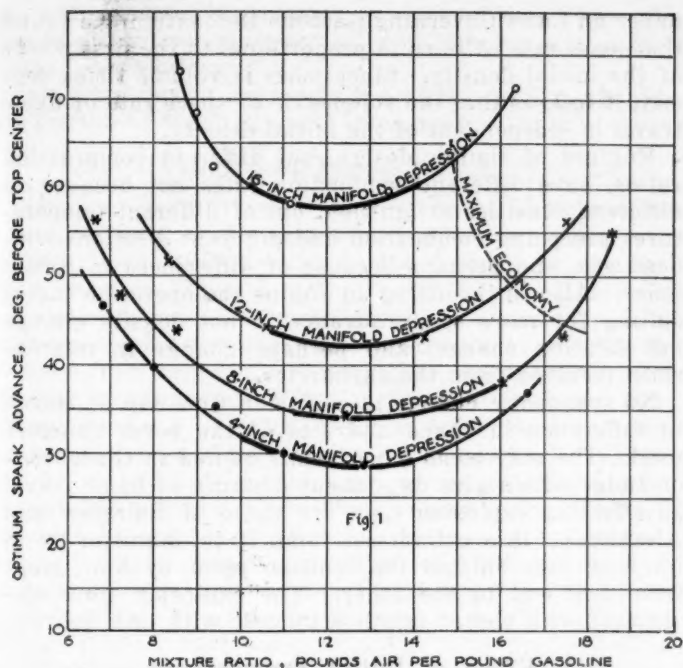


Fig. 1—Curves showing optimum spark advance on Ford engine running with various mixture ratios at 800 r.p.m. and with intake air and discharge water at 140 deg. Fahr. Atwater-Kent open circuit ignition used

angular speed is $\frac{360 R}{60} = 6 R$ deg. per second. With $a =$ angle of spark advance, the timing of the spark ahead of dead center position of the engine, in seconds, is $\frac{a}{6 R}$. It can be shown that for optimum spark setting $\frac{a}{6 R} = \frac{3}{4} \times$ (actual explosion time) $= \frac{3}{4}$ ("characteristic time") \times (dilution factor) (turbulence or speed factor). In this relation the "characteristic time" is a constant for a given engine and ignition system, for the ordinary operating conditions of the engine.

Various experimenters with mixtures of coal gas and air have shown that, for mixture ratios from 5 to 7.5 by volume, the explosion time runs from 0.04 to 0.06 sec., with relatively minor effects of size of bomb, and none from change of initial pressure (density).

It has been shown also that mixtures of gasoline vapor and air have the same characteristics as those of coal gas and air; minimum explosion time in the bomb was 0.058 sec. In contrast to this explosion time for gasoline in the bomb Watson gives explosion times in a racing engine of 0.0055 sec. with single spark ignition, and 0.0037 sec. with double spark ignition. The speeding up of the explosion, more than ten times, in the engine as compared to the bomb, is said to be due to turbulence effect in the engine.

Humphrey found explosion time 0.025 sec. in a 28½ by 30 in. cylinder, at 128 r.p.m.; Clark found explosion time in a 9 by 17 in. cylinder, at 180 r.p.m., to change from 0.033 sec. under normal operation to 0.08 and 0.09 sec. when turbulence was allowed to die out before igniting.

Effect of Fuel Change on Explosion Time

Judge shows that explosion time in a certain engine was 0.013 sec. with gasoline as fuel, and 0.014 sec. with benzol. Comparing the data as to explosion times of various fuels, tested under parallel conditions, it seems that change of fuel has a very small effect on explosion time.

Alcohol might, however, be different from the hydrocarbon fuels; the latter, with substantially the same explosion times, could be substituted for one another in an engine without any appreciable change of optimum spark advance.

Curves of explosion time plotted against mixture ratio are fairly flat over a considerable range of mixture ratio. This suggests that optimum spark advance, in practical operation of an engine, may not be radically affected by mixture ratio. Tests on this point were first made by us on a Ford engine in the Cornell University laboratories, with results shown in Figs. 1 and 2.

Air flow to the carburetor was measured by a Durley meter and box, gasoline flow by a modified "flow-meter" (Penberthy). Optimum spark advance was found by trial, by watching the dynamometer scale and adjusting for maximum torque so far as spark timing affects the torque. This effect is fairly definite; on the Ford a timing error of about ± 20 deg. decreases the torque 10 per cent, when the spark advance is the only variable.

Spark Advance for Maximum Economy Mix

In Fig. 1 the lines of optimum spark advance vs. mixture ratio, for constant intake manifold depression (in. of mercury) have each a minimum best advance around the 12 to 1 mixture ratio. The thickened part of each line is the region in which the brake m.e.p. is within 1 lb. of its maximum value for that intake manifold depression.

It seems a justifiable statement that the maximum power mix is practically identical with the mix of minimum value of best spark advance. The maximum economy mix requires about the same spark advance as maximum power mix near closed throttle, and 10 to 15 deg. more advance near open throttle.

In Fig. 2 the thickened central part of each constant suction line is the region where optimum spark advance is within 2 deg. of its minimum value. Again the comparison shows the practical identity of the mix for maximum power and for minimum best spark advance. The conclusion is, of course, that the maximum power mix is

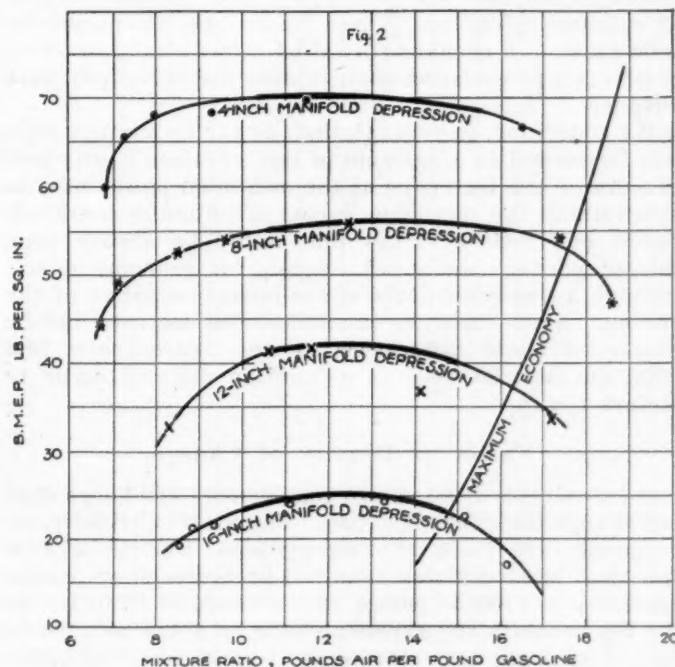


Fig. 2—Curves showing brake m.e.p. of Ford engine running with optimum spark advance at 800 r.p.m., intake air and discharge water at 140 deg. Fahr.

the fastest burning mix of the series, or the mix of the highest reaction velocity.

The same general conclusions were arrived at from tests on a Continental model 7-R six-cylinder engine in the same laboratory. The test procedure was here more elaborate; at each of the six fuel flow rates five or more tests were made of brake-m.e.p. vs. spark advance. From curves of these tests the spark advances for best m.e.p. were picked off, with corresponding values of the m.e.p.'s, to plot the values in Fig. 3. The tolerance in spark ad-

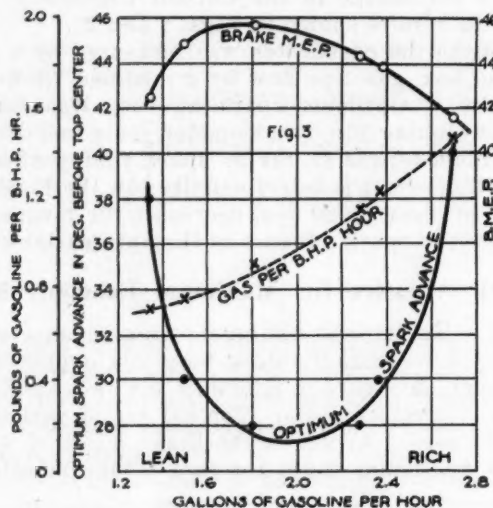


Fig. 3—Performance curves of Model 7-R Continental six-cylinder engine running at 1000 r.p.m. with 8 in. of mercury manifold depression. Temperature of entering air, 75 deg. Fahr.; of discharge water, 140 deg. Fahr.

vance, to keep within 10 per cent of best power is, in this engine, less than ± 15 deg.

If the mixture ratios are such that power is within 10 per cent of best power, as affected by mixture ratio, optimum spark advance does not vary more than ± 10 deg. from that for the maximum power mix (minimum value of optimum advance). These values are, of course, for 1000 r.p.m. and perhaps should be better stated in terms of percentage variation than in absolute values of spark advance.

We concluded, in general, that, as far as mixture ratio was concerned as a variable in this problem, it was best to work on the lean edge of the maximum power mix, so determining the minimum values of optimum spark advance, and getting values that would be always safe, though perhaps not great enough for economy mixes, through all possible parts of the operating range of the engine. As to fuels we concluded that we need not be concerned about differences of one hydrocarbon fuel from another, so long as detonation did not occur to disturb the case.

Factor of Density of Charge

It has already been shown that density of charge does not change the explosion time. The most conclusive experiments are those of Petavel, who tried in a 4-in. spherical bomb a series of initial pressures from atmospheric up to 1100 lb. per sq. in.—a range of 75 to 1. At the top pressure the explosion time on a 1:6 volumetric mix of coal gas and air was still 0.058 sec., the same, within the accuracy of measurement, as at the low pressure. Density of charge is not then a factor in this problem.

The same conclusion follows from Midgley's recent

paper on Laws Governing Gaseous Detonation. He found that mass rate of burn is proportional to the first power of the initial density. Since mass is volume times density, it follows that the volumetric or space rate of flame travel is independent of the initial density.

Engines of similar design, but different compression ratios, have different combustion rates not because of different densities at ignition, but of different temperatures preceding combustion and different dilutions with dead gas, and perhaps because of differences in turbulence. Also in throttling an engine the operative factor calling for more spark advance is not density change but dilution change, and perhaps change in mixture ratio received from the carburetor.

No systematic change in explosion time can be traced to difference in shape and size of the bomb chamber used. The only bomb experiments quoted in Glazebrook or Judge which give data about distance of flame travel as affecting explosion time are those of Bairstow and Alexander. In a cylindrical bomb 10 in. diameter by 18 in. long they shifted the ignition point by 3-in. steps from one end to the other. The explosion time was shortest with center ignition, longest with end ignition.

Effect of Initial Temperature

Their data are reasonably well fitted empirically by assuming that explosion time is proportional to the square root of the distance from the ignition point to the more remote end of the bomb. The same square root of distance for time of flame travel also fits close to Watson's figures, quoted above, of explosion time in a racing engine at 0.0055 sec. with single ignition, and 0.0037 with double ignition. It seems probable that in an actual engine the shape of the combustion chamber and the position of the spark plug or plugs in it will be more important practically in determining the explosion time in that combustion chamber than its absolute dimensions.

Data on effect of initial temperature on explosion time, in bomb experiments, seem quite lacking. The best information seems to be given in Midgley's Laws Governing Gaseous Detonation, where it is found that combustion rate varies approximately as the cube of the absolute temperature before ignition.

For a given engine the rise of temperature during compression is a definite multiple of the temperature at beginning of compression; this in turn is set largely by the atmospheric temperature entering the carburetor. Hence for a given engine the explosion time and the spark advance vary inversely, at some power more than 1, as the absolute temperature of the entering air.

In comparing one engine with another, since rise of temperature during compression varies with the $(\gamma - 1)$ power of the compression ratio, and combustion rate with the cube of the absolute temperature preceding ignition, we will have combustion rate varying as compression ratio to the $3(\gamma - 1) = 3 \times (1.33 - 1) = 1.0 \pm$ power; or, in other words, in similar engines of different compression ratios optimum spark advance should vary inversely as the compression ratios.

The increase of combustion rate with the cube of the absolute temperature may well be the reason why, in constant volume combustion, the combustion rate increases as combustion progresses. For the expansion of the first portions burned causes adiabatic compression of the unburned residue and consequent rise of its temperature ahead of its chemical reaction.

The lesser spark advance which satisfies an engine as it progresses from clean to dirty ("carboned") in the combustion chamber is also largely a temperature effect. A dirty engine has less loss of heat to combustion cham-

ber walls than a clean one; a higher temperature of charge at end of compression, and hence needs a decreased spark advance.

Just where, with regard to the piston motion, should combustion be timed for best efficiency?

Velocity of Flame Travel

If time of flame travel in constant volume combustion is proportional to the square root of distance, the velocity of flame travel varies as the first power of time from ignition. This is not in conflict with Midgley's calculations; he has been studying combustion rate as a function of pressure and temperature, not as a function of time from ignition. Furthermore, flame velocity is actually a compound affair; the flame travel has two components, one of actual velocity with regard to the gas and the other of mass-motion of the gas itself. There will be no attempt in this paper to separate these two components of flame velocity with regard to the cylinder.

I have assumed a combustion chamber of cylindrical form, of height equal to one-third of its diameter, and with ignition point in one end, half way from one side to the center. The time for a complete combustion (explosion time) I have taken as unity. The final velocity has also been taken as unity. With velocity proportional to time, the same decimal then stands for time or velocity in terms of their terminal values. The distance of flame front from the ignition point varies as the square of time from ignition.

Pressure-Time Curves of Combustion

Up to about half the time of complete combustion the flame front makes a hemispherical surface about the ignition point, the flame not yet having been cut off by running into combustion chamber walls. In this first half of combustion time, therefore, the area of the flame front varies as the square of the distance of flame front from ignition point; and in consequence as the fourth power of time from ignition (since the distance itself varies as the square of time).

The volumetric rate of combustion is the product of flame velocity and area of flame front; hence the volumetric rate of combustion varies as the fifth power of time from ignition. The total volume or mass burnt is the time integral of the volume rate of combustion, and pressure rise is proportional to the total volume or mass burnt up to a given time. Hence we conclude that during the first half of a combustion, started from a spark plug in a cylinder wall, the pressure rise varies approximately as the sixth power of time from ignition.

This is the explanation of the shape of the beginning of pressure-time curves of combustions, in either bombs or engine cylinders. There appears to be, on such curves, an appreciable lag, or time interval, in which there is no perceptible rise of pressure. On a sixth power law the pressure at time $\frac{1}{2}$ is $\frac{1}{64}$ of that at time unity—or simply too small to notice, relatively. See Fig. 4 for curves representing the mathematical relations outlined above.

At about one-half the time of a complete combustion the flame front ceases to be hemispherical, being cut off in part by running into the walls of the combustion chamber. From near this time on the flame front begins to lose area, first slowly, then rapidly, becoming zero as combustion finishes.

Change of Flame Front Area

The exact law of change of flame front area with position or time depends upon the shape of the combustion chamber and the position of the ignition point—what we may call the geometric layout of our case. For the sim-

ple combustion chamber chosen and described I have worked out these flame front areas for the last half of combustion time, and they are shown in Fig. 4 with an arbitrary choice of maximum area of flame front equal to unity.

The product of flame velocity and flame front area gives the volumetric rate of burn. This continues to rise for a little while even after the flame front area begins to decrease, because the flame velocity is still increasing; but soon the decreasing area of the flame front becomes the dominant factor and volumetric rate of burn must reduce to zero as combustion finishes.

The time integral of the volumetric rate of burn is the volume burnt, and is proportional to pressure rise from the combustion. This calculated curve of pressure rise against time in Fig. 4 is the end to which we have been working. It is shown to be a direct consequence, in its form, of the law of flame velocity against time, and the geometry of the combustion chamber. The velocity-time law chosen was the simplest possible; it remains to be seen whether the results deduced from it give a fair picture of the actual progress of combustion in bombs or engine cylinders.

We may summarize the results shown in Fig. 4 in a few numerical statements. According to these calculations the maximum area of flame front occurred at 0.68 times the explosion time; the maximum rate of burn at 0.74 of the explosion time; the beginning of perceptible pressure rise from combustion at between 0.40 and 0.50 of explosion time, and the half rise of pressure at 0.74 of explosion time. The figures for the fractions of explosion time at which pressure rise begins to be perceptible and at which it reaches half value, are the important figures for our study.

To check the shape of the pressure time curve in our own experiments we used a 7-hp. stationary Fairbanks hit-or-miss engine in the Cornell University laboratories.

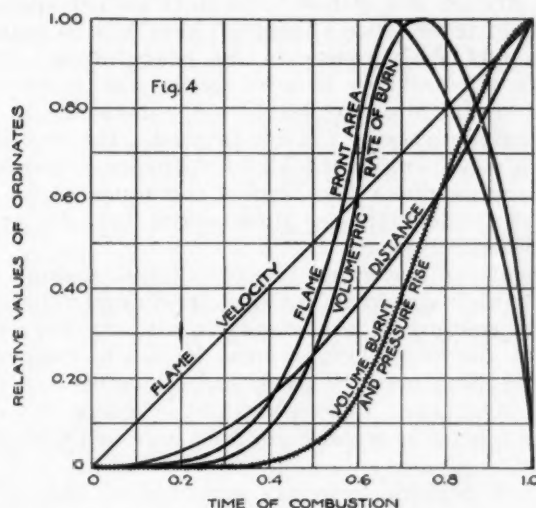


Fig. 4—Theoretical study of progress of combustion in a cylindrical combustion chamber

The speed of 340 r.p.m. made it possible to take indicator cards with a Crosby indicator; the indicator drums drive was offset 90 deg. so that pressure time cards were obtained. We found in this engine the ratios to total explosion time for beginning of pressure rise and for the half rise to be: on lean mix, 0.54 and 0.81; on maximum power mix, 0.54 and 0.77; on a rich mix, 0.44 and 0.71.

Optimum Spark Advance and Explosion Time

Altogether, it seems that for engines in general we may assume pretty accurately that half pressure rise

will occur at, or very close to, 75 per cent of the explosion time. The theoretical conclusions of Fig. 4 are confirmed experimentally, though the assumption as to the law of flame velocity was so inadequately simple.

This brings us to the relation, or correlation, between optimum spark advance and explosion time. For we may reasonably assume that we want to time the spark, for best results, so that combustion occurs one-half before and one-half after dead center position of the piston, or that half pressure rise occurs at dead center. This makes about the best approximation we can to having the combustion line vertical on the pressure-volume indicator card and we know pretty well from practice that having the combustion line nearly vertical in that card goes with the best power and efficiency of the engine.

To check this assumption that timing of spark so that half pressure rise occurs at dead center, or that explosion time is three-fourths over at dead center, for best pressure volume indicator card shape, we made experiments on the 7-hp. Fairbanks stationary engine. Both pressure-volume and pressure-time indicator cards were taken.

It is interesting to study the change in combustion habit with mixture ratio. The time from ignition to beginning of pressure rise seems to be independent of mixture ratio. The lean mix has the first half of pressure rise, after the beginning of it, slow and the last half fast, as compared with the other mixes. The rich mix is slow in both halves of pressure rise, but more so in the second half. The maximum power mix is not only the quickest

burning, but has considerably more rapid and more symmetric pressure rise.

The very high speed of burning in the last half of the pressure rise of the lean mix may be tied up with the fact that such mixes are the only kind that backfire in an engine. The calculated optimum spark advances for all three mixes are astonishingly close together; 42, 39 and 43 deg.; and these results confirm our tests on the Ford and Continental engines very nicely.

We may consider that we have proven experimentally what we deduced theoretically, that optimum spark advance is such that the half pressure rise occurs at dead center; and that this stage of pressure rise occurs practically at 75 per cent of the explosion time after ignition. Writing a for spark advance in degrees, and a_0 for optimum advance, e for explosion time, R for r.p.m., we have then

$$\frac{a}{6R} = \text{advance in seconds, and } \frac{a_0}{6R} = \frac{3}{4}e,$$

whence $a_0 = \frac{9}{2}eR$ and $e = \frac{2a_0}{9R}$. By finding a_0

with an engine on the test stand, through change of spark as a single variable, noting torques resulting (speed, intake suction, temperatures, etc., being held constant), we can measure e , explosion time, under the conditions of the test. So through optimum spark advance we can investigate changes of explosion time by mixture variation, dilution, turbulence, etc., and open the door to a wide field of study of combustion processes in our engines.

British Air Ministry Issues Aircraft Specifications

THE British Air Ministry recently issued specifications of three types of aircraft that will be required for long and short routes in the near future. These machines will probably be used by the new commercial aviation organization which is to be formed.

Two-engine airplanes are not favored. The new types must be a single-engine machine for European transport, a three-engine plane for Empire communications, and either the single-engine or three-engine type for operation between Egypt and India.

Specifications are given in great detail, making provision for high structural quality, safety and reliability, while the comfort of passengers is also considered an important factor. Engines must be easily removable, metal propellers must be used, and silencing is considered an advantage. Cabins must have emergency exits in the roof, must be water-tight, and provided with flotation gear.

No stunt performances are expected of any of the types, and no sensational accomplishments are looked for. The Air Ministry has taken severely practical lines and expects the aircraft designer to do the same. None of the types specified will be larger in power and size than has hitherto been required.

The single-engine machine will be required to carry a crew of two, with passengers and luggage on the basis of one ton for every 400 hp. Fuel is to be carried for 3½ hours' flight, and the plane is to have a speed of 110 m.p.h. at 3000 ft. It will not be required to climb more than 11,000 ft. and its landing speed must not be more than 45 m.p.h. Take off must allow the machine to clear an obstacle 60 ft. high 600 yd. from the starting point.

The three-engine machine for Imperial communica-

tions must have a maximum power of 2100 hp. and must be capable of control with two of its engines of 700 hp. each idle. Fuel for 1300 miles against a headwind of 15 m.p.h. must be carried, thus making it possible to remain 13 hr. in the air. Its speed at 10,000 ft. must be 90 m.p.h., and it is not expected to climb higher. The maximum alighting speed must be 50 m.p.h., but a lower rate would be considered an advantage. Sleeping accommodations for two must be provided, while water, ice tank, and certain provisions must be carried.

The Middles East planes must not exceed a total of 1000 hp., whether single or triple engined. They must carry fuel for 500 miles against a headwind of 30 m.p.h., fly 95 m.p.h. at 10,000 ft., must have a ceiling of 11,000 ft., and a landing speed of 45 m.p.h.

All types should carry special accommodation for mails, while facilities should be available for the sorting of correspondence while flying.

IMPROVED accuracy, greater production and longer cutter life are the advantages claimed for a new type of circular milling cutter which has been developed by the Brown & Sharpe Mfg. Co.

In appearance the new cutter resembles the usual backed-off and relieved circular cutter. The cutting profile, however, is ground to form throughout, with the result that each tooth in the cutter is of exact form and cuts uniformly. For the present these cutters are limited to forms of a comparatively simple outline, such as gear, sprocket and spline shaft profiles.

The maker states that the limitations of size and variety of the ground form cutter is based on practical considerations and that the production of any comparatively simple form is feasible.

South African Market Will Absorb 5000 Cars in 1923

Dealers look forward to sound trade and assured profits now that old stocks have been liquidated. Deflation period over. Stabilization of tire business expected this year. Alcohol fuel being sold in small quantities. New agencies appearing.

PROSPECTS for building up a good motor vehicle trade in South Africa for the remainder of this year are very favorable. The trying conditions brought about by the period of depression and the upheaval on the Rand are no longer serious and business is once again on a sound footing. Old stocks have been for the most part liquidated and a conservative estimate shows that about 5000 motor vehicles can be sold this year.

These are the chief points brought out in the third annual report of the South African Motor Traders' Association, Ltd., recently received through the National Bank of South Africa, Ltd.

The report reads in part as follows:

The motor trade in South Africa today is in a very much better position than we have been able to report in previous years. The old heavy stocks of cars are entirely liquidated; indeed every trader has a long waiting list of customers, and is anxiously awaiting deliveries from overseas. With regard to other stocks, the deflation period is over and firms know where they stand. It only remains under the present conditions to build up new business on sound conservative lines.

As a matter of interest it may be noted that there are about 45 different makes of cars, 25 motorcycles and 20 tractors on the market in South Africa, and new agencies are constantly appearing. These newcomers are always hailed with delight by the motor press, but it is becoming a matter of concern to many close observers that a market so restricted as that in South Africa should have so many types of cars and cycles seeking a share of the business.

During the last year there were imported into the Union 4840 motor cars, 144 trucks, 1317 motorcycles, 170 sidecars and 10,671,847 gal. of fuel. The returns for tires are not yet to hand. This represents a remarkable amount of business, taking all things into consideration.

Trade Anticipates Good Business

The prospects for 1923, without being exceptional, are quite good. Certain authorities have quoted figures ranging from 6500 to 10,000 as being the immediate market for cars in the Union. One cannot deprecate too strongly wild assertions of this kind. It is most important that the motor trade for the coming year should be built on sound lines, and any concern that is setting its mind on a consumption for 1923 of 10,000 cars is looking for trouble.

It may be assumed that in 1921 about 4800 cars were sold. If we take 5000 as an outside figure for 1923 we shall be doing very well indeed. This figure cannot be despised; it represents a large amount of business when sales of fuel, tires and accessories are taken into consideration as well; and the motor trade of this country may look forward with confidence to the coming year as being

one of sound trade and assured profits.

The position of the tire market has been very unsettled during the year. During 1920 imports were very large and in excess of consumption, and these stocks were not all liquidated during 1921. The year opened with a considerable amount of anxiety because of these overstocks, which were getting into the hands of jobbers. The position was first of all complicated by the jobbers themselves importing directly from small American factories. But the whole market collapsed when the change over from the fabric to the cord tire necessitated all the fabric stocks in the country being placed on the clearance market. The liquidation of these enormous clearance stocks is rapidly approaching an end, and the prospects are that this trade will stabilize itself during the coming year.

Fuel Situation Favorable

The Government control of the price of gasoline came to an end in June of last year. It will be the work of the incoming Council to endeavor to arrive at some arrangement whereby the small profit on gasoline can be preserved to the motor trader.

We note that the British Imperial Oil Co. is installing a bulk storage plant in Durban. This plant will have a capacity of 3,000,000 gal. and is expected to be in use before the end of the year.

Among alcohol motor fuels, "Natalite" still takes the lead. Others on the market are "Penrol," "Acetol," "Enerjel" and one made from prickly pears. These all report satisfactory results, but have not yet been marketed in sufficient quantities to have any effect on the situation.

The establishment of coal by-products plants in several districts leads one to hope that the production of benzol will be undertaken in the near future. This has been proved in England an excellent fuel, especially when mixed with petrol.

Following on the industrial upheaval of last year, the garages have passed through a period of quiescence. Wages have been constant at a lower level than previously obtained, but still higher than those that have been paid in kindred trades. There have recently been signs of renewed activity among trade unions, and certain questions concerning holidays have been tentatively raised by the workers. It is not expected, however, that any further troubles in this direction will eventuate in the near future.

Summarizing the conclusions to be drawn, one would say that the motor trade in South Africa has reached normal more rapidly than most other industries, and that while trade at the present dimensions may fairly be looked for in the future, it would be unwise to anticipate any very great extension during the coming year.



Three-panel Overland Red Bird display made available for retailer's merchandising campaign

Twenty Merchandising Helps Given to Dealers in Introducing New Models

Originality and thorough planning features of campaign used in bringing out the Overland "Red Bird." Many novelties are supplied to retailers at minimum cost. New methods successful.

THE merchandising methods used in the introduction of the Overland Red Bird offer a good example of what can be done by originality backed with proper kind of dealer cooperation. Before the first step was taken in announcing this model the entire work was planned to the last detail. Twenty ideas were used to focus attention of dealers and buyers on this car. Dealers who fell in line with the suggestions offered and went the limit with the plan of the factory were uniformly successful.

Inasmuch as a large part of a campaign has to be built up around the name of the model, it is advantageous

to use a name which can be symbolized readily. The choice of "Red Bird," at the time of the year when birds are just returning from the South, struck a timely note.

A series of mystery advertisements opened the campaign. During April, *Motor World*, *Motor Age* and other business papers carried advertisements calling the attention of dealers to the fact that a car was to come out in the \$750 class, which up to this time was vacant. The business papers of May 10 and the national magazines of May 12 carried center spreads, and newspapers on May 11 carried 1200-line announcements, disclosing the identity of the car. Twenty-four sheet posters were

How the dealer was helped to sell the Overland Red Bird

- 1—Mystery advertisements in business papers and newspapers.
- 2—One-sheet window posters.
- 3—Center spread in colors in national magazines.
- 4—1200-line newspaper announcements.
- 5—24-sheet posters billboarded.
- 6—Repainted highway bulletins.
- 7—Blue and gold cloth back-drops for window display.
- 8—Colored paper discs to trim small trees in show windows, giving effect of apple orchard in bloom.
- 9—Cut-outs of human figures for use in window display.
- 10—Three-panel Red Bird display.
- 11—Printed invitations mailed by dealers.
- 12—Announcement banner over store front.
- 13—Jumbo reproduction of national magazine advertisement for store display.
- 14—Gummed cut-outs of Red Bird for windows.
- 15—Four-page Red Bird folders.
- 16—Special spare tire covers.
- 17—Flying Red Bird toys for children.
- 18—Lantern slides showing Red Bird.
- 19—Newspaper publicity.
- 20—600-line newspaper follow-up advertisements.

billboarded on May 11, and the highway bulletins were repainted on May 11. All of these described the new model.

When the model finally was announced, paper red bird cut-outs were pasted on dealers' windows, on Overland owners' windshields, and wherever they could be placed. These were furnished to dealers in lots of 100 at \$1.25 or at \$12.50 per thousand. Dealers were supplied with flying red bird toys at \$7.50 a hundred or \$75 a thousand. Blue and gold cloth back-drops for window displays were made available, as well as colored paper discs to trim small trees in the show windows, giving the effect of an apple orchard in bloom.

A three-panel Red Bird display, cut out of human figures, for use in the cars, as shown in the illustration herewith, were made available for dealers' show windows. Printed invitations were mailed out by dealers. Announcement banners were hung over the store fronts. Publicity was secured through the newspaper reading columns, and even lantern slides were made up showing the Red Bird. All of these were furnished to the dealers at cost price.

The back-drop of blue cloth spattered with gold, in sections 12 ft. long by 10 ft. high, came at \$12 a section. Colored paper discs sufficient for two trees were \$3.50. The three-panel display, together with the frame for holding it, cost \$20.

To reach people who might never pass the showroom a quantity of Red Bird printed invitations were supplied. These were in two colors and took the place of the usual post card. They were supplied with envelopes to match and cost dealers 2 cents each. Red Bird spare tire covers were on hand and one was given to every purchaser of the car. Lantern slides were sold to dealers at \$1 per set of three.

Mystery Campaign Arouses Curiosity

It was the intention of the Willys-Overland Co. to so arrange the campaign that any dealer who went wholeheartedly into it could not fail to arouse interest in his community. The element of curiosity, aroused by the mystery campaign, helped to gain the attention of prospective buyers, while the cutouts, toys and effective window displays brought customers into the dealer's shop.

S. A. E. Financial Condition Improved, Report Shows

AN interesting résumé of the financial position of the S. A. E., showing a marked improvement in the past year, was contained in a report by C. B. Whittelsey, the treasurer, presented at the Summer Meeting of the Society. It follows:

It is very gratifying to be able to present a financial report which reflects steady growth in the income of the society throughout the first eight months of the fiscal year.

The financial statement, as at the close of business on May 31 last, shows an excess of income over expense of \$878.33. At the same time last year we had a deficiency of about \$18,300. In other words, our net income for the present fiscal year has increased nearly \$20,000 as compared with that for same period of last year.

In past years it has been the custom of the Finance Committee and the Council to equalize the budget of the income and expense and, with the exception of one or possibly two years, the society staff has always been able to hold the expense below the limits of the budget and maintain the income at a figure above the budget, leaving a surplus of from \$10,000 to \$30,000 during the year.

Financial Operations

It is well to impress upon the membership of the society that the S. A. E. is operated, from a financial point of view, along the same general lines as a business house. At the present time the income from members' dues constitutes about 30 per cent of the gross income of the society. The balance of the gross income is derived from advertising sales, initiation fees, interest on bank balances and investments, miscellaneous sales and contributions from affiliated organizations.

The society should endeavor to have its income greater than expense during the years in which business is flourishing, in order to provide a surplus for use during periods of depression.

A comparison of the receipt of members' dues shows that about the same number of members had paid their dues on or before May 31 last as had paid them at the same time last year. The balance sheet and the budget comparison, for the period ending May 31 last, are attached.

ASSETS	1923	1922
Cash	\$24,275.99	\$17,593.13
Accounts Receivable	35,031.47	31,323.86
Securities—Cost Value	96,550.63	98,513.13
Accrued Int. on Securities	1,548.83	1,485.36
Inventories	15,001.16	15,760.61
Furniture and Fixtures	7,792.54	8,281.70
Items Paid in Advance—Charges Deferred	3,493.13	7,169.84
TOTAL ASSETS	\$183,693.75	\$180,127.63
LIABILITIES AND RESERVES		
Accounts Payable	\$6,411.50	\$9,159.29
Dues and Misl. Items Rec. in advance to be credited monthly	27,826.27	28,928.24
Reserve set aside for anticipated expense	25,878.39	21,829.87
Prize Fund Balance	817.66
General Reserve	121,881.60	138,570.49
Unexpended Income	878.33	*18,360.26
TOTAL LIAB. AND RESERVES...	\$183,693.75	\$180,127.63

*Deficit.

	Budget Eight Months	Income and Expense Eight Months
INCOME		
Dues and Subscriptions	\$50,000.00	\$50,640.25
Contributions	5,000.00	5,000.00
Interest	3,333.34	3,164.43
Initiations	8,800.00	8,755.00
Advertising Sales	103,186.16	106,370.30
Miscellaneous Sales	8,737.34	10,757.45
TOTAL INCOME	\$179,056.84	\$184,687.43
EXPENSE		
Publications	\$38,833.34	\$38,674.19
Sections	6,966.68	7,526.92
Research	12,666.68	11,786.56
Employment Service	2,700.00	3,854.72
Standards	18,300.00	17,343.92
Cost of Membership Increase	6,666.66	5,576.62
Cost of Advertising Sales	27,233.34	27,622.49
Cost of Miscellaneous Sales	5,826.82	7,687.90
Meetings—Net Cost	7,216.66	11,504.31
General Expense	52,646.66	52,231.47
TOTAL EXPENSE	\$179,056.84	\$183,809.10
Net Unexpended Income	\$878.33

ACORD tire specially designed for speed buses has just been announced by the Seiberling Rubber Co. This tire has a semi-round tread and a thinner sidewall than found on the All-Tread form of tire put out by the company. While the All-Tread design is retained it is not as heavy on the bus tire and it comes down over the sidewall. The speed bus cord tire is being made in two sizes, 36 x 6 in. and 40 x 8 in.

Rickenbacker Adopts Lapping Process on Piston Pin Bearing Surfaces

Method is used also for piston pins, rings, and ring grooves. Reduction of irregularities makes wear less rapid in service. Usual grinding precedes additional operations. Bethel-Player automatic machine is used. Life of parts materially increased.

By J. Edward Schipper

THE Rickenbacker Motor Co. is now using a lapping process to reduce the usual irregularities in the piston pin and piston ring bearing surfaces. One of the most difficult problems in automobile engine manufacture has been to produce and maintain a close fit between the piston pin and piston pin hole and also between the piston ring and the piston ring groove. The Rickenbacker company states that between the piston pin and the piston pin hole, the closest commercial limit which it has been able to maintain with the ground piston pin has been .00025 in. on diameter and taper. While this ground surface is apparently highly polished, the microscope shows that in reality it is quite ragged. This ragged surface rapidly breaks down in service and finally takes on a high polish. In doing so, irregularities of the piston pin very appreciably hasten the wear on the piston pin hole.

It has been found by observation that in 1000 miles of service a ground piston pin will wear about .0002 in. and the piston pin hole will wear about .0004 in., giving a total added clearance after the initial 1000 miles of service of .0006 in. This great wear on the piston pin hole is due largely to the very fine file-like surface of the ground pin.

C. M. Tichenor, production manager, says that he has been led to adopt the lapping process after grinding because of this initial wear. The lapping operations take place after the usual grinding. The lapping is performed on a Bethel-Player automatic lapping machine, Fig. 1 and 1-A, which has been recently developed. With this it is claimed that the pins can be lapped, that a uniform diameter can be maintained within .0001 in. and that the pins can be held parallel within that limit and that surface can be produced which removes the minute grinding marks on the surface of the pin. These minute grinding marks are usually about .0001 in. in depth. Pin dimensions are inspected and checked with the aid of a Johanson gage. Production inspection measurements are taken with a fluid gage, so that the human element in the measurement is practically eliminated. The company claims that with this method they can maintain commercial precision within .0001 in.

Maintaining Accuracy in Piston Pin Hole

To maintain a corresponding accuracy in the piston pin hole presented another unusual problem. The first step necessary is to get the piston pin at exactly right angles with the piston skirt and to have the two bosses exactly in line. The two holes are bored on an engine lathe with a single point or fly-cut tool. The pin hole is bored .0002 in. under the nominal diameter. Then the hole is reamed with a piloted spiral blade reamer, Fig. 2,

to insure that the alignment will be maintained.

Then, to insure a perfectly round hole and smooth surface a rotary broaching or burnishing tool, Fig. 3, follows the pilot reamer and burnishes the hole about .00025 in. larger than the reamed size. The Rickenbacker company does not believe that a reaming process will do the job satisfactorily. The purpose of this rotary broach is to lap out all the minute, rough particles and to produce a hole with a highly polished surface and uniform diameter, thereby permitting close fitting of the piston pins. With this precision maintained, it is claimed that a selective assembly for the pins is not necessary. Furthermore, it is expected that the service life of the pins will be doubled or trebled because the highly finished surface will decrease the rapidity of wear.

Excessive Ring Clearance Eliminated

Just about the same results have been experienced in fitting the piston rings in the ring grooves. It has been found necessary to obtain a highly finished surface on the sides of the rings and on the sides of the grooves in order to reduce the rather rapid initial wear. With the previous methods employed, the Rickenbacker company found that if the piston ring was fitted in the groove with a clearance of .0005 in., the wear on these two parts amounted to about .001 in. in excess clearance after 1000 to 1500 miles of operation.

Elimination of excess clearance on a piston ring is important because of the immediate effect it has on oil leakage. For instance, an excess clearance of .001 in. on a piston ring presents an area for the passage of oil and compression 250 times as great as a .015 in. gap at the ring joint, assuming that the piston diameter is .003 in. smaller than the bore, which exposes a section of .0015 in. wide at the ring joint. It has been found, according to the Rickenbacker company, that this excess clearance on the piston ring is responsible for the greater part of the so-called oil pumping.

The lapping process has been adopted to overcome the manufacturing difficulties grinding a thin section such as a piston ring and to get a highly finished surface which is absolutely flat and parallel. This process will produce a ring within .0001 in. limit. It is also claimed that a ring finished in this manner will be highly polished and parallel. A Bethel-Player machine shown open in Fig. 4 and closed in Fig. 5 is used for this work.

A new method had to be adopted to secure a ring groove which has a surface up to the same standard as a lapped ring. Sides of the ring grooves machined with an ordinary formed tool have very minute ridges or feed marks which break down rapidly in service. According to the Rickenbacker company, the wear developed at this

Details of Rickenbacker Piston Pin Lapping Process



1—Bethel-Player lapping machine used to lap piston rings to size. 1A—Same machine in open position. Pins are given a lapping operation by the eccentric movement of the table. 2—Reaming piston pin hole with a piloted spiral blade reamer. 3—Rotary burnishing tool used after reaming. 4—Bethel-Player lapping machine for piston rings seen in open position. 5—Same machine in closed position. 6—Machine for burnishing piston ring grooves

point is about .0005 in. during the initial working in of the car, after which the wear is naturally slower.

To improve on the finish of the ring grooves the width of the ring groove is machined .001 in. under the ring width. Then the grooves are finished finally with a roller broach mounted on a carrier in an engine lathe. This roller type broach, Fig. 6, can float endwise and consequently can adjust itself to the grooves formed by

the tool. The roller, 5 in. in diameter with highly polished sides, is forced into the groove and allowed to rotate long enough to polish the sides of the grooves to a high finish to very accurate dimensions. The roller broach is lubricated with oil during this burnishing process. As soon as the broach wears .0001 in., it is discarded and replaced with a new one. This results in a very close fit of the ring in the groove.

Bullard Places New Vertical Chucking Machine on Market

A CONTINUOUS production cycle and a wide range of adaptation are characteristics of the new type of vertical chucking machine made by the Bullard Machine Tool Company. While this machine is intended primarily for the turning, boring and facing operations on flywheels, other parts requiring similar operations may be handled with equal facility.

The type which is described here is known as the 18-in., four-spindle Continuous Chucking and Turning Machine and consists briefly, as illustrated, of a circular base carrying four chucks with four cam operated tool heads on a rotating member which revolves continuously around a fixed concentric cylindrical column. The tool heads are fed over the work and returned to the loading position by circumferential cams bolted to the barrel of the column near the upper end. Drive for the entire machine is taken from a constant speed electric motor of 20-30 hp. running at 1200 r.p.m., which has its base at the top of the fixed column.

As the chucks and their respective tool heads are carried on the same rotating member at a constant speed, feed and duration of cuts are controlled by the fixed circumferential cams. The tool heads are mounted in vertical slides and are actuated by rollers at the upper ends which engage with the cams. By means of change

gears the time for one complete revolution or cycle can be varied from 43 sec. to 32 min., inclusive. Chucks are loaded and unloaded with no interruption of the steady rotation of the carrying member. The cycle is divided into two sections, the first, approximating 113 deg., is allotted to the elevation of the tool head, unloading and reloading of the chuck and return of the tool head to the point of cutting. The cutting operations occur throughout the second sector of approximately 247 deg.

Spindles carrying the chucks, or

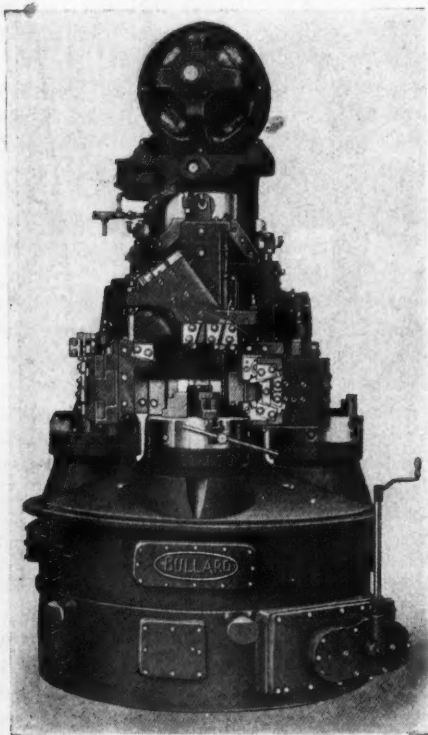
work holding fixtures if desired, automatically stop as the corresponding tool head reaches the unloading position and start again as the cutting point is approached. Change speed gears are provided in the base of the machine which permit variation of the spindle speeds through the range of 10-50 r.p.m. As a single set of tools performs the work on the piece in the chuck throughout the cutting cycle, gears can be shifted selectively to suit the speed of the spindle to the particular operation. One spindle may be rotating at a high rate of speed for center boring while the next or any other may be turning slowly for a peripheral cut. Hand control is also provided for the instantaneous stopping or rotation of any chuck or carrier.

In addition to the tool heads for vertical cuts, compound heads are also utilized for cross feed or facing operations. Special heads may be secured for production of bevelled or formed surfaces. In all cases the actuating cam is designed to suit the requirements of the particular piece to be machined, the common feed for all heads being determined by the shape of this cam.

Different Adjustments Possible

Due to the specialized operations which are performed upon the work in one cutting cycle, this machine is capable of three different arrangements to suit the requirements of the production schedule. In the first case it may be operated as one of the units of a battery and the same cuts made at all four heads, producing four identical operations in each cycle. In the second case, alternate tool heads are identical and two operations are performed upon the same machine. Each piece is transferred from one operation to the other and therefore makes two complete cycles in the machine. In the third case, each head is arranged for a different group of operations on the same piece. These operations are produced in continuous sequence on the same machine and one piece is completed with each cycle. Finished work from the first chuck is transferred to the second and then to the third and fourth at the completion of each cycle, therefore each piece passes four times through cycle of carrier rotation.

This machine is also equipped with the internal flood oiling system which is found in the Mult-Au-Matic, made by the same company. Considering the capacity and type of work produced, the floor space required is comparatively small, as circular space of 78 in. diameter accommodates the complete machine, which is 120 in. high and weighs 25,000 lb.



New Bullard continuous chucking and turning machine

IN a Forum letter entitled "Balloon Tires Give Riding Comfort," by C. H. L. Flinterman, which appeared in AUTOMOTIVE INDUSTRIES of May 31, the tire weight given in the next to the last sentence of the second paragraph should read 35 lb. instead of 30 lb.

1st Quarter Tractor, Motorcycle, Battery & Spark Plug Exports

COUNTRIES	TRACTORS						MOTORCYCLES			STORAGE BATTERIES		SPARK PLUGS	
	Garden		Wheel		Track Laying		Parts	No.	Value	Parts	No.	Value	Value
	No.	Value	No.	Value	No.	Value	Value			Value			
Europe													
Austria								25	\$6,497	\$308			
Azores and Madeira Islands							\$8						
Belgium			375	\$133,903	12	\$6,421	1,258	210	47,213	4,313	395	\$4,734	\$4,917
Czechoslovakia							92	130	31,128	3,854			358
Denmark			25	9,096			7,738	196	43,161	35,883	5,310	86,549	1,961
Estonia			46	17,475			868	5	1,655	828	4	135	3,369
Finland			83	29,841			539	98	22,187	4,981			1,206
France			161	60,518	10	7,943	29,114	157	31,005	17,347	2,765	21,328	12,884
Germany								13	2,309	150			
Iceland and Faroe Islands											25	144	
Italy			65	23,577			16,496	410	89,753	5,051	101	842	3,178
Latvia	50	\$8,179	93	39,968				1	363				
Lithuania							221						
Malta, Gozo and Cyprus			6	2,220						130			
Netherlands			4	1,697	22	13,300	460	712	169,788	11,696	258	2,761	536
Norway			15	5,466			381	305	72,692	19,957	64	950	2,235
Poland and Danzig							0,180			14,865			
Portugal			1	929			85	18	5,299	4,888	138	1,443	2,355
Rumania							37	1	294	441	1	25	
Russia			330	128,823			14,850						
Spain	20	5,925	88	32,707	9	6,375	3,751	182	46,882	2,046	1,591	22,420	6,953
Sweden							3,662	437	110,533	23,005	112	3,292	8,560
Switzerland							574	56	13,297	1,264			34
Turkey	5	1,850	30	11,100									135
Ukraine			141	54,825			13,096						
England	21	2,912	285	109,597	6	5,169	27,882	363	86,031	24,445	1,935	36,855	17,397
Scotland							270						416
Ireland							335				98		
Yugoslavia								6	1,611	215			
North and South America													
Canada	7	4,120	962	713,448	18	30,906	79,814	205	48,230	41,520	4,070	53,367	71,114
British Honduras	9	2,882	22	23,938	5	17,083	2,131				4	80	583
Costa Rica											32	714	140
Guatemala			2	1,982				7	1,600	319	30	156	253
Honduras			10	8,223	4	11,951	1,224	2	245	91	39	367	1,432
Nicaragua					1	2,750	1,142				11	305	131
Panama							2,132			717	312	4,440	438
Salvador			1	720							114	1,610	
Mexico	5	2,057	31	18,683	6	20,010	48,162	18	4,300	6,396	1,073	28,105	5,319
Newfoundland and Labrador							405			42	23	229	156
Barbados	2	340					47				51	816	378
Jamaica			1	620			131	3	619	231	159	2,035	191
Trinidad and Tobago			1	351			141	3	348	69	155	1,751	414
Other British West Indies			1	351			109	6	1,410	507	62	944	236
Cuba	7	1,190					17,960	9	1,920	7,281	1,339	24,430	7,317
Dominican Republic	1	750	74	34,740	2	8,300	922	12	1,788	589	120	1,395	916
Dutch West Indies								2	452	133	3	73	61
French West Indies			2	802			155	1	130		19	221	
Haiti											11	899	
Virgin Islands	1	170					114				31	110	
Argentina	37	13,829	314	243,584	2	12,300	24,363	62	15,572	11,372	8,136	79,553	12,266
Bolivia			2	703				42	10,902				
Brazil			111	39,346			3,425	25	6,305	1,186	2,864	35,325	5,880
Chile			3	3,966			254			380	193	3,911	1,709
Colombia	3	621	8	3,819	2	1,032	6,288	3	1,194	187	59	1,124	1,167
Ecuador			4	3,155	3	3,285	11				51	814	751
British Guiana							176			8	61	636	10
Dutch Guiana							191				35		580
French Guiana													11
Peru			4	2,604			18,971	2	228	78	309	2,043	988
Uruguay			38	21,159			271	7	1,907	2,367	525	5,661	221
Venezuela			1	330	2	12,597	16,140	4	858	260	62	940	641
Asia													
British India			13	13,774	5	22,246	6,318	69	15,839	2,633	2,642	21,277	4,143
Ceylon								15	3,541	740	56	861	400
Straits Settlements							394	5	1,039	995	146	2,385	3,079
Other British East Indies							25	1	124				
China							111	34	9,993	756	281	8,536	2,161
Chosen										97			
Java and Madura			1	576			2,893	58	9,391	9,608	467	7,336	3,609
Other Dutch East Indies							998			2,175	12	379	378
Far Eastern Republic							350						
French Indo China										276			
Hejaz, Arabia and Mesopotamia							15				25	300	
Hongkong								17	3,052	382	18	518	681
Japan	17	3,782	3	1,960	12	33,602	2,404	216	29,285	24,249	177	6,909	15,367
Kwantung											1	40	
Palestine and Syria							628				35	507	
Philippine Islands	1	223					10,870	20	3,521	3,470	358	7,780	3,265
Siam			1	659			191	1	151				
Oceania													
Australia	9	8,544	511	358,492	86	89,578	40,030	1,485	360,478	60,423	2,063	31,387	22,342
British Oceania							66	2	456	191	2	75	
French Oceania										52	1	32	71
New Zealand			2	1,887			4,101	477	115,706	23,392	1,551	22,344	3,410
Other Oceania										13	3	75	75
Africa													
Belgian Congo			1	800							67		785
British West Africa							143				1,360	35,200	3,719
British South Africa					2	1,437	2,751	259	62,147	16,797	42	662	
British East Africa					29	17,693		2	750	537	20	120	370
Canary Islands											33	676	264
Egypt							759	22	4,621	936			43
Algeria and Tunis			15	12,205	5	2,607	3,014	3	444				
Other French Africa								3	375	14			
Liberia													46
Morocco			32	11,240			1,650	19	2,858	209	3	50	811
Other Portuguese Africa							242			99	1	30	
Spanish Africa										200			
Total	195	\$57,374	3,919	\$2,185,859	243	\$226,585	\$430,849	6,446	\$1,503,677	\$398,030	41,919	\$580,720	\$244,816

Thread Cutter Offers Possibilities of Increased Production Rate

Product developed by Fellows Gear Shaper Company operates on generating principle. Rapid rotation of material permitted. 1200 cutting teeth presented to material every minute. Type of machine allows use of coarse feed. Many advantages claimed.

THREADS on worms, screws, taps and similar work are produced by a generating process on the most recent product of the Fellows Gear Shaper Company. This machine is known as the Thread Generator and operates on a molding or generating principle similar to that of the gear shaper produced by the same company, using the same type of helical cutter.

Parts to be threaded are placed between centers parallel to the longitudinal axis of the machine and rotated by an extension shaft from the gear box at the head. The tailstock may be shifted to accommodate any length of piece up to 18 in. maximum. The cutter spindle is mounted at right angles to the piece in a geared head which is traversed longitudinally and driven by another shaft projecting from the head. Trunnion bearings which are concentric with the driving shaft support the cutter head from the cutter slide. Rotation of the head about this center determines the relationship of the cutter and work or the depth of cut.

Control of the cutter head is brought about by a bar which is supported in a seat on a rearward projection of the cutter slide and restrained axially by a smaller rod which is anchored to the gear box at the head. Resting on this bar is a shoe or roll, as requirements may demand, which is held in a rod that passes up through the cutter head and is threaded into a worm wheel, the latter being operated through a worm and hand wheel for set-

ting the cutter to proper depth. The depth control bar can be made in various shapes so that roughing and finishing cuts can be taken, or may be made plain and only one cut taken.

Several advantages result from the application of the generating principle to threading operations. As the gear shaper type of cutter having several teeth is used, both the work and the cutter can be rotated at a high rate of speed. In conjunction with this feature, a coarse feed can be utilized as a result of the following characteristics:

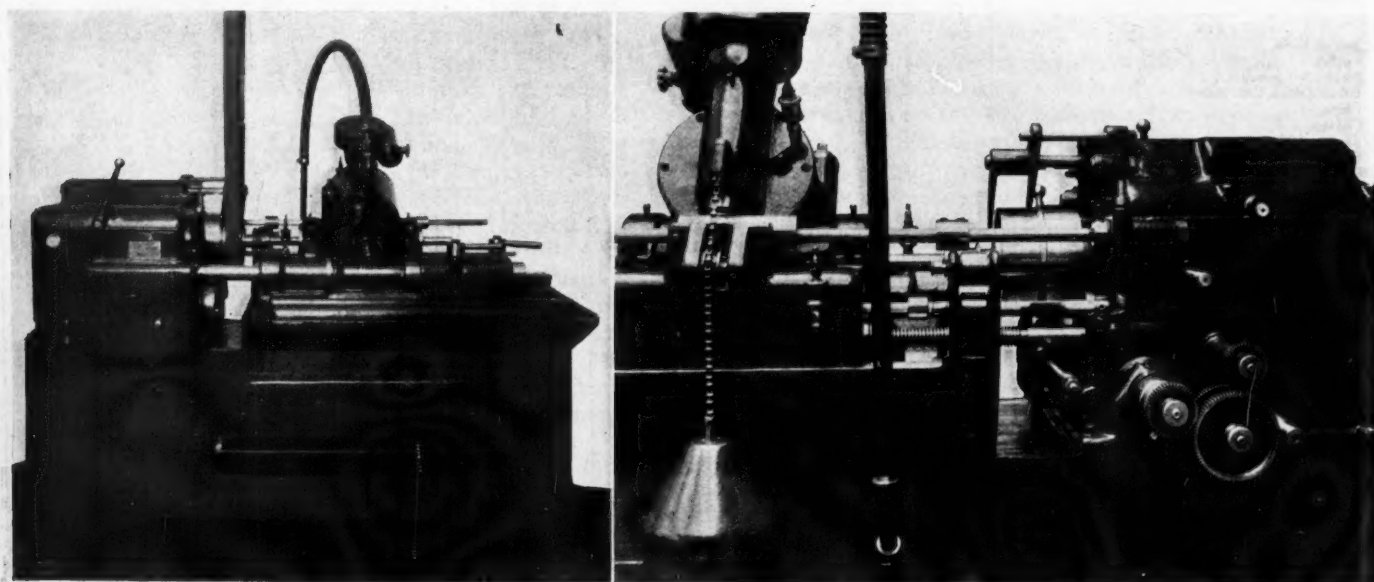
First. The cutter being rolled in mesh with the work, any particular portion of the cutting edge on the tool remains in contact with the work for a very short period of time.

Second. This rolling action enables the tool to take what might be known as a shaving cut, the tooth spaces performing the function of a chip breaker.

Third. One tooth is not required to do all the cutting, but many teeth are brought successively and rapidly into contact with the work.

Fourth. Due to the tooth-shaped contour of the cutter, the ratio of heat radiating surface adjacent to cutting surface is high.

The machine is driven by a single pulley at the right end of the gear box at the head. This pulley is mounted on the shaft which drives the cutter head and also ex-



Left—Front view of the new Fellows thread generator. Right—Rear view of machine showing depth control bar, feed screw and change gears

tends into the gear box, driving the balance of the machine through the change speed mechanism. Change gears are provided for establishing the ratio between the number of teeth in the cutter and work. Similar gears are used to traverse the cutter along the work at the desired feed per revolution of the latter, the cutter slide being moved by a lead screw from the gear box. A differential mechanism and a change gear combination compensate for the translating motion of the cutter, otherwise the travel of the cutter would cut off the threads of the piece in operation.

In order that the cutter slide can be traversed in both directions, a reversing clutch is installed on the main feed shaft. By this mechanism it is possible to traverse the cutter over the work; then as the cutter goes out of contact the tripping mechanism operates to stop the machine. In cases where the work can be finished in one cut, the cutter traverses from right to left, and when it goes out of contact the piece is removed and another inserted. The reversing clutch is then shifted and the cutter traverses from left to right, obviating the necessity of returning the cutter slide to its original position at the completion of each cut.

As an illustration of the possibilities of this machine the maker presents the following example: In cutting

a triple thread worm of 2.10 in. diameter the work can be rotated at 600 r.p.m. and a cutter of $3\frac{1}{2}$ in. pitch diameter, having 21 teeth and a linear pitch of 0.525 in., rotates at a speed of 57.14 r.p.m., which amounts to 330 f.p.m. at the outside circumference of the work. Each tooth of the cutter remains in contact with the work for about $\frac{1}{20}$ sec. and 1200 cutting teeth are presented to the work every minute. These speeds are very high and bring about a corresponding increase of production possibilities.

The machine, known as the No. 1 type, with standard equipment, has the following capacities:

Maximum length of thread—12 in.

Maximum center distance—18 in.

Outside diameter—4 in.

Maximum pitch— $\frac{5}{8}$ in. linear or 5 diametral.

Maximum helix angle—23 deg.

Maximum pressure angle— $14\frac{1}{2}$ deg.

When provided with standard equipment this machine will cut single, double, triple and quadruple threads of $\frac{1}{4}$ in. or 6 mm. to 16 mm. or $\frac{5}{8}$ in. inclusive, linear pitch. By the use of a substitute worm gear combination in the cutter head, single threads may be cut from 0.050 in. or 2 mm. up to and including 0.250 in. or 6 mm. linear pitch.

British Engineer Forecasts Bus Design of Future

IN a paper read before the graduates of the British Institute of Transport, G. J. Shave, chief engineer of the London General Omnibus Co., recently discussed future developments of bus design. Touching upon suspension, he expressed doubt as to any great advance occurring, chiefly for the reason that loads are continually varying. He supplemented this, however, by saying that as the speed of recovery of metallic springs is very much slower than that of rubber there is an indication that improvements in suspension will involve the use of rubber; and here we may note that in the latest type of London bus the volute flat sectional steel buffer springs previously used to assist in coping with loads beyond 50 per cent of the maximum have been displaced by a special form of rubber buffer. Shave does not believe in progressive main springs because, he says, they are liable to fracture on account of the varying degrees of stress to which the leaves are subjected.

Use of cushion or semi-pneumatic tires was forecasted, while the general use of inflated pneumatics was doubted. Four criticisms were directed against the latter, viz., relative cost, additional passenger comfort not sufficient to justify increased cost, greater tendency to skid, and risks attached to sudden collapse. The need for reducing the unsprung weight was emphasized in connection with riding comfort.

In dealing with power plants, Shave gave the opinion that for a 46-passenger bus 30 hp. at 1000 r.p.m. and for 54-seaters 35 hp. at 1000 r.p.m. are the most economical sizes. He also said that the bus engine of the future would probably be air-cooled, run on low grade fuel and have a high compression; an engine burning crude oil he considered quite possible. As to air-cooling, he considered the reduction in weight thus to be gained was very important.

As regards the bus transmission of the future, his opinion was that it would be of a mechanical type with a variable gear giving a greater range of ratios than any gear-set at present in use; he drew attention to the waste of fuel now occurring because of the need for running on the level with light loads at high engine speeds. The

definite prediction as to mechanical gears is surprising, it may be interpolated, for although the company has just put a new type of three-speed bus on the road there is a well-authenticated report that the L. G. O. C. has ordered 150 gasoline electric chassis from a specializing firm in England.

After expressing a view in favor of worm drive (the new London bus has a worm and internal gear system of transmission), Shave mentioned the possibility of a track-laying system in lieu of wheels being adopted, believing that the disadvantage of existing renderings may be eliminated by future developments.

In the reference to bodywork, the present-day tendency to abandon timber and use metal work was mentioned and the opinion stated that this could be carried too far and result in reverberation; it was held that timber reinforced by metal was likely to hold sway. Ventilation was another point and the view was expressed that finality will never be reached, if only for the reason that twenty passengers in the interior of a bus will never agree on the amount of ventilation required. One fact, Shave said, stands out prominently; there must be some *visible* means of ventilation. No matter if there is a hidden device functioning perfectly and changing the air definitely at a given rate, unless the passenger can see a window open he will believe the vehicle is stuffy.

Some remarks of Mr. G. A. Green of Detroit and New York were taken up. Shave did not agree with Green that a low center of gravity reduces rolling; he held that the rolling angle is dependent upon the height of the center of gravity of the sprung weight from the spring seats and not from the ground level, though he admitted that a low center of gravity improves the overturning angle and renders the vehicle more stable.

Then, too, he took exception to Green's view as to the advantage of vertical steering pivots and maintained that the lifting effect which has to be overcome by the driver when steering a vehicle with inclined pivots is actually an advantage because of the great assistance it provides to a quick recovery after a turn has been made.

Sunbeams Win First and Second Places in Grand Prix Race

Bugatti comes in third. Winner covers course at average rate of about 72 m.p.h. Voisin sets 50 lap record and does 300 yd. at 122 m.p.h. Small, light and heavy touring car events run off at Tours are taken by Mathis and Peugeots respectively.

By W. F. Bradley

SAINT ANTOINE DU ROCHER, FRANCE, July 3—(By cable)—Segrave, in a Sunbeam, won the French Grand Prix which was run here today over a distance of 496½ miles. The time of the winner was 6 hr. 35 min. 19.6 sec., which corresponds to an average speed of just under 72 m.p.h. Divo, also driving a Sunbeam, was second, his time being 6 hr. 54 min. 25 sec. Friedrich, on a Bugatti, came in third, in 7 hr. 0 min. 22 sec., and Lee Guinness, on a Sunbeam, fourth, in 7 hr. 2 min. 3 sec.

Bordino, in a Fiat, led for eight laps. He was overtaken by Lefevre in a Voisin, who set a fifty-lap record at 87 miles per hour and covered 300 yd. at 122 miles per hour. Lefevre had to quit the race while holding the lead, when a stone passed through the crank case of his engine. Guinness then took the lead and retained it for four laps, losing it to Giaccone in a Fiat. The latter also maintained the lead for four laps, until he had to retire with carbureter trouble.

Salamano (Fiat) then took the lead and held it for eleven laps. With only three more laps to go he ran out of gasoline. His mechanic sprinted to the pits, some two miles away, for fuel, but did not get back in time. Divo, then got into the lead, but, being unable to remove the filler cap of the gasoline tank, had to run on the reserve tank, which necessitated refilling at the end of every lap. This gave the lead to Segrave, who had been running in third place since the race had been half completed, waiting for an opportunity to get to the front.

There were seventeen starters. Goux (Rolland-Pilain), failed to appear, having broken his engine the day before the race. On the first lap Vizcaya (Bugatti) missed the Membrolle turn and ran into the crowd of spectators, injuring fifteen of them. The Bugattis and Voisins, being untried, failed to show much speed. Guyot, on a Rolland-Pilain, after holding second place for a short

time, went out six laps from the end, when in fourth place. Hemery, his team mate, abandoned after seven laps.

A record-breaking crowd attended the annual running of the Grand Prix for touring cars at Tours. The contestants were grouped in three divisions, according to weight and classified as small cars, light cars and heavy touring cars. Lahms, driving a Mathis, won the division for small cars, with an average speed of 50 1/3 m.p.h. The light car race was won by Cippot in a Peugeot at an average speed of 42¾ m.p.h. Two other Peugeots finished this race a few seconds behind the winner. The last race, that for heavy touring cars, was won by Boillot at the wheel of a Peugeot.

The small car division consisted of cars having a minimum weight of 880 lb. and there were thirteen entrants. The light car group having a minimum weight of 2200 lb. had five entrants and the last division, that having a 3080 lb. minimum weight, had only four cars at the starting line.

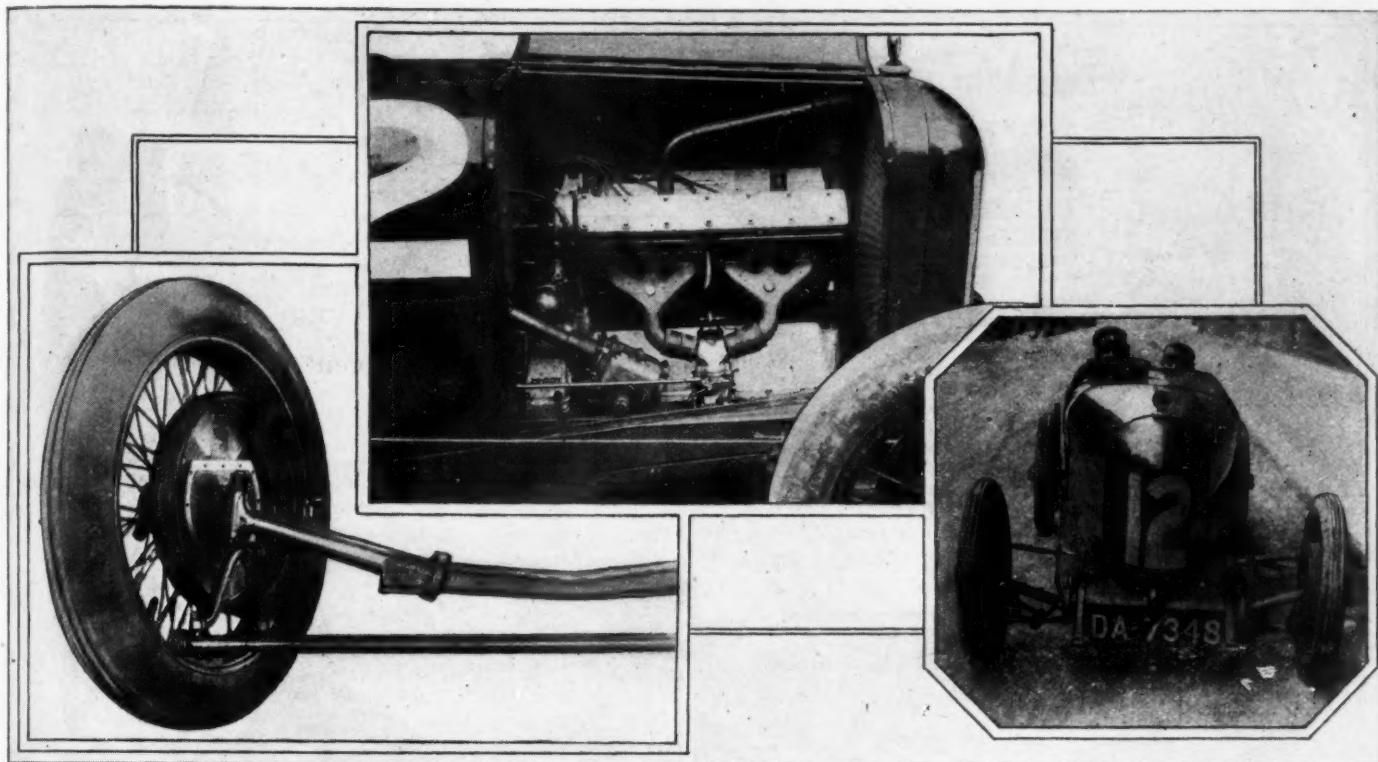
Originality in plenty was found on the cars entered in the big race. This was the second race to be held in France under this piston displacement rule. The first one, in 1922, on a road course near Strasbourg, resulted in an easy victory for Fiat, with an average speed of nearly 80 m.p.h.

Fiat

The Fiat engineers, Fornaca and Cavalli, abandoned last year's successful six-cylinder racing cars for eight-in-line models. This change was not unexpected, for last year six-cylinder engines were used merely because of economy in construction and to save time. Since it began experimenting on small piston displacement racing engines the Fiat company has always preferred the eight to any other number of cylinders.

Cars and Drivers in the French Grand Prix 122 Cu. In. Road Race:

Delage.....	Rene Thomas	Rolland-Pilain.....	Albert Guyot
Fiat.....	Pietro Bordino		Victor Hemery
	Ernest Giaccone	Bugatti.....	Pierre de Vizcaya
	Charles Salamano		Friedrich
Voisin.....	Henry Rougier		Cystria
	Arthur Duray		Marco
	Morel	Sunbeam.....	Kenelm Lee Guinness
	Andre Lefevre		Segrave
			Albert Divo



Details of Sunbeam Grand Prix Racer

Three views of the Sunbeam six-cylinder chassis and its components. Engine is said to closely resemble the Fiat which was used in the winning car last year. Front axle is made in three parts, the center being of I section and the ends of circular section

This year's Fiat models are a development of the design which has been followed for the last four or five years. The cylinders are separate steel forgings having a bore of 60 mm. and are united into two groups of four by welded-on sheet steel water jackets. The stroke is 87.5 mm. There are two valves in the head. They are inclined at an angle of 42 deg. and are operated by two overhead camshafts with drive from the rear by a vertical shaft and bevel gearing. Each valve is closed by three concentric springs. There are light followers between cam and valve.

One of the outstanding features of the engine is the use of roller bearings for the crankshaft and the connecting rods. Fiat was the first to experiment in this direction, and in order to get satisfactory results found it necessary to build the bearings in its own shops. These gave complete satisfaction last year and have been continued on the new models. There is a bearing between each cylinder and one behind the timing gear, giving ten in all for the crankshaft. The rollers are in direct contact with the shaft. The connecting rods have split big ends with two bolts. Pistons are of aluminum and rods are I-section.

The supercharger which Fiat used this year for the first time is a rotary type positively driven off the front end of the crankshaft contained within a housing which forms a support for the radiator. Air is drawn in around the base of the radiator. Aluminum blades carried in roller bearings are employed for the rotor and the air thus compressed is carried to the carburetor through a passage cast with the aluminum basechamber.

To avoid an excess of air when accelerating, automatic valves are used, these also having the additional advantage of being a precaution against fire in case the engine spits back. In addition to the device for reducing the amount of air when speeding up, there appears to be an arrangement for enriching the mixture.

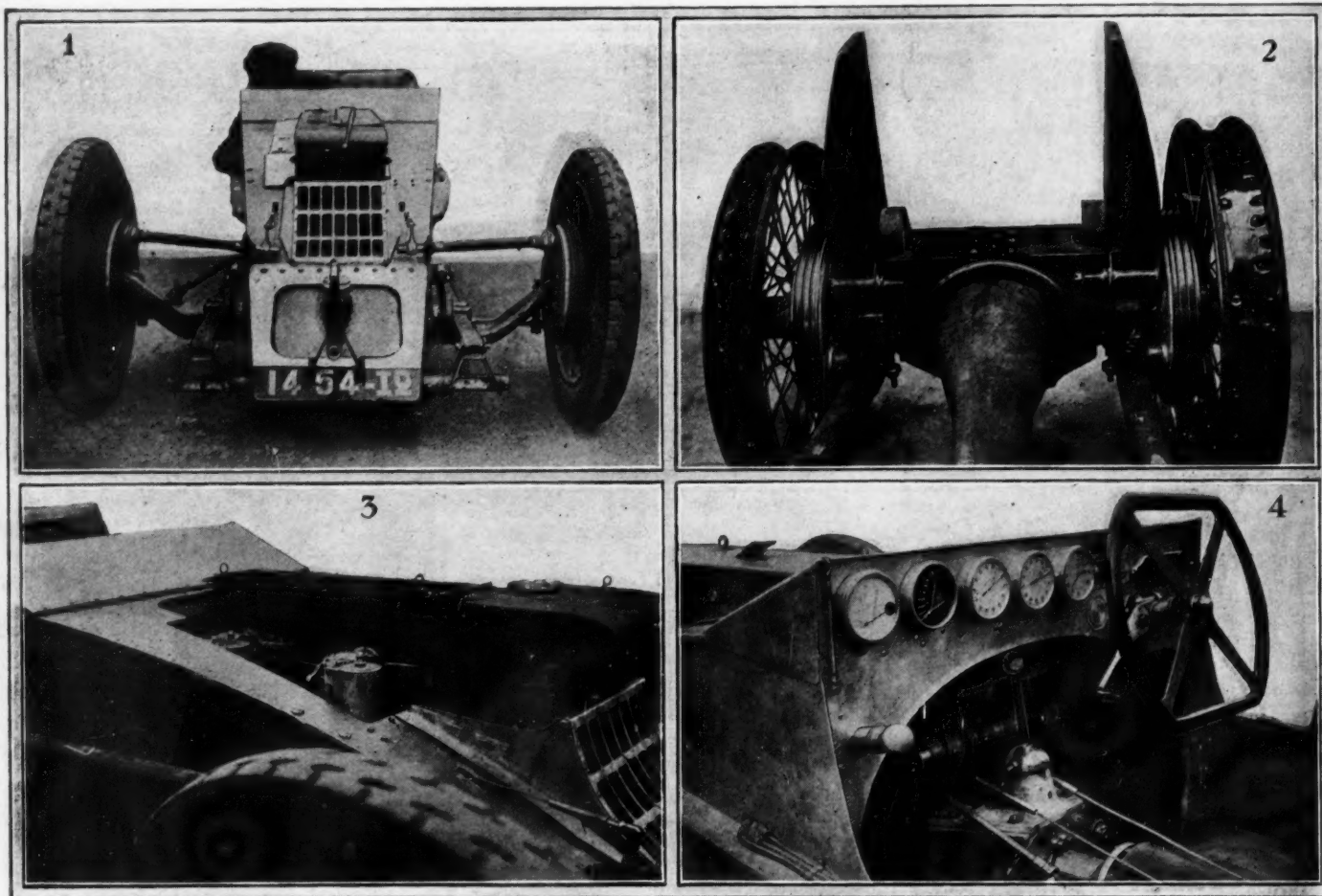
Ignition is by Scintilla high tension magneto mounted crosswise at rear of the engine and supplying currents to plugs placed in the head of the cylinders. To get the 80 deg. advance necessary with these engines, a system of variable timing by advancing the armature of the magneto has been adopted. A double oil pump is employed and the castor oil is contained in a tank inside the frame members.

A dry disc clutch is used. The gearbox, which forms a unit with the engine, comprises four speeds and reverse, with the change speed lever on the top of the box. The steering gear is bolted to the front face of the right rear crankcase hanger. A pressed steel combined axle housing and torque tube of the same general type as used on standard Fiat chassis is employed, with drive taken through a spherical head attached to the rear face of the gearbox. Wire wheels with straight side tires are used. Springing is by semi-elliptics front and rear, supplemented by Hartford shock absorbers. Brakes are applied on all four wheels, with the use of a servo mechanism. Track is 47 in. front and rear, wheelbase 103 in., and weight, empty, 1455 lb.

Sunbeam

Sunbeam this year is racing with new six-cylinder cars designed by Engineer Coatalen. There are many points of resemblance between the models produced by this British firm and the Fiat cars of last year, the explanation being the presence on the Sunbeam technical staff of Engineer Vincent Bertarione, who, until a few months ago, was a member of the Fiat racing department.

The six-cylinder Sunbeams have separate steel cylinders machined out of the billet. They have a bore of 67 mm. and the stroke is 94 mm. There are two valves inclined in the head, two overhead camshafts, and camshaft drive from the rear by spur gearing. The compression ratio is 7 to 1. Like the Fiats, these engines have



Six-cylinder, 122 cu. in. Voisin Entrant

1—Front view showing axle, brakes, tanks and radiator. Note that springs are shackled at the front end. 2—Rear axle arrangement. The wheels are close together so as to come within the body side line. No differential is used. Upright struts prevent side motion of body in relation to axle. 3—Arrangement of radiator and engine. 4—Instrument board, rear end of powerplant and steering gear. Latter is nearly horizontal

roller bearings throughout, there being eight bearings for the mainshaft, and split ends for the connecting rods, with the rollers in direct contact with the shaft. Roller bearings are also used for the two camshafts. Ignition is by high tension Scintilla magneto, with variable advance of the armature. A single plug per cylinder is used. Lubrication is of the dry sump type. A single Silex carbureter was adopted for the race.

According to the statement of the Sunbeam engineers, the horsepower output is 108 at rather more than 5000 r.p.m. In this connection it is interesting to recall that the Fiat engineers have issued details of their last year's engine, according to which the maximum horsepower was 95 at 5200 r.p.m. This engine had a bore and stroke of 65 by 100 and the following timing: Intake opening, dead center; intake closing, 55 deg. after lower dead center; exhaust opening, 50 deg. early; exhaust closing, 10 deg. late. Ignition advance, 60 deg.

The Sunbeam engine is constructed as a unit with clutch and gearbox, the whole having three point attachment to the frame. The clutch is cone type, with ferodo lining. There are four forward speeds and reverse. The drive shaft is an open type, with two universal joints.

The front axle is built up in three parts, as on last year's cars, the center portion being of I-section and the two end parts of circular section. Brakes are fitted on all four wheels and are applied through a servo mechanism. Track is 51 in. at the front and 47 in. at the

rear. Wire wheels with Dunlop straight side tires are used. The weight of the car is given as about 1450 lb. empty.

Gabriel Voisin, aviation engineer and automobile builder entered in the race the set of cars showing the greatest departure from standard practice. A year ago Voisin won the French limited fuel Grand Prix road race, and when the rules for the 1923 edition of this contest came out he severely criticised the clauses making it impossible to do any original work on the body lines. With a view to proving that more could be gained by a scientific study of the external lines of cars than by increasing the engine output, he entered a set of four cars in this year's 122-in. Grand Prix race and laid himself out to build the most perfectly streamlined cars ever seen.

Voisin

The Voisin engine is a six-cylinder Knight type, but not built under Knight patents, for these are no longer valid in France. The cylinders, which are in one casting, have a bore of 62 mm. The stroke is 110 mm. Compression ratio is slightly more than 7 to 1. Unlike any of the other engines in the Grand Prix race, ball or roller bearings are not used for the crankshaft. The engine was produced to the designs of Andre Lefebvre, a young engineer who was responsible for last year's racers. It is declared that the engine was arranged to run at 5000 r.p.m. There is a very good power output

The Voisin entries, of which this is one, are said to be the last word in stream lining. Rear wheels are recessed in the sides of the body which has a frame structure resembling an airplane fuselage



at 3000 r.p.m., however, and acceleration is claimed to be remarkably good. Among the outstanding features of the engine is the use of magnesium pistons of the slipper type, with detachable cast iron skirts held in position by a shoulder which fits into the piston groove and are prevented from turning by studs. It is claimed that with this design all the light weight advantages of the magnesium piston are obtained without any of the dangers of the metal disintegrating through contact with the cylinder walls. The rods are of approximately elliptical, hollow section, and have split big ends with white metal lining. Lubrication is forced type with all the oil outside the engine, one pump delivering the lubricant to the bearings and another scavenging the base chamber.

The engine, clutch and gearbox constitute a unit on which the radiator and all the brake control gear are mounted. The timing gear housing is cast with a platform on which the radiator is carried. The change speed lever is on the top of the box and the brake control mechanism, with independent adjustment for front and rear sets, is also mounted on the gearbox. Naturally the clutch and carburetor controls are on the engine unit.

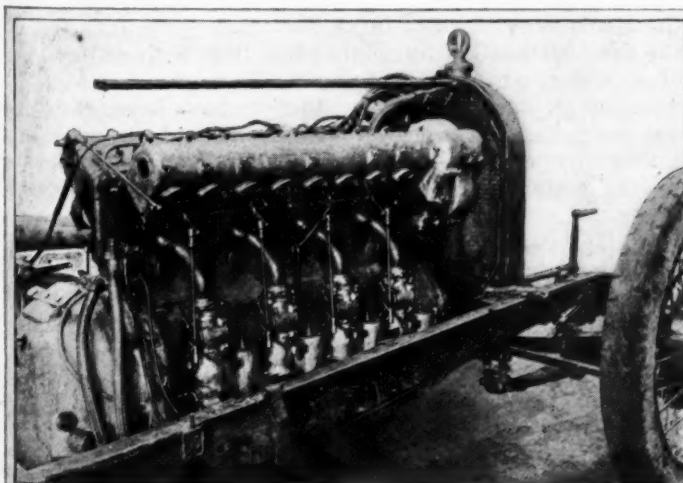
Aviation practice abounds not merely in the design, but in the various details of construction of these original cars. Gabriel Voisin's object appears to have been to produce in the body lines the nearest possible approach to a deep section airplane wing, with an absolutely flat under surface, a fine entering edge, and the deepest section just a little behind the center line. At the front, normal 54-in. track is used, but at the rear

the track has been reduced to 30 in., and the driving wheels are recessed in the body. Their discs form a substantially continuous surface with the body.

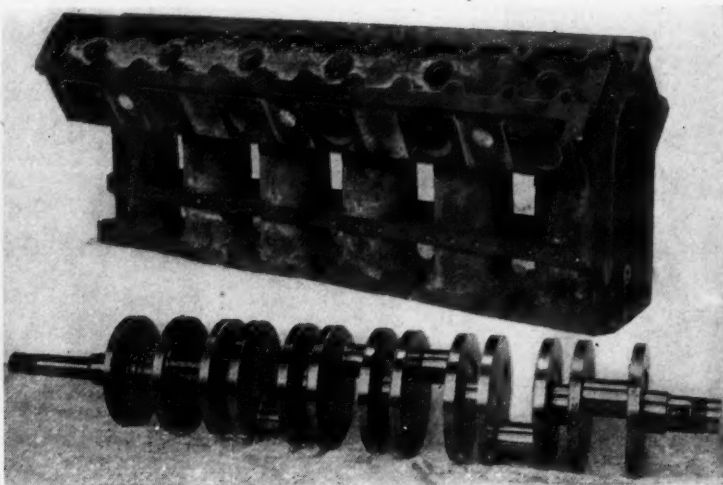
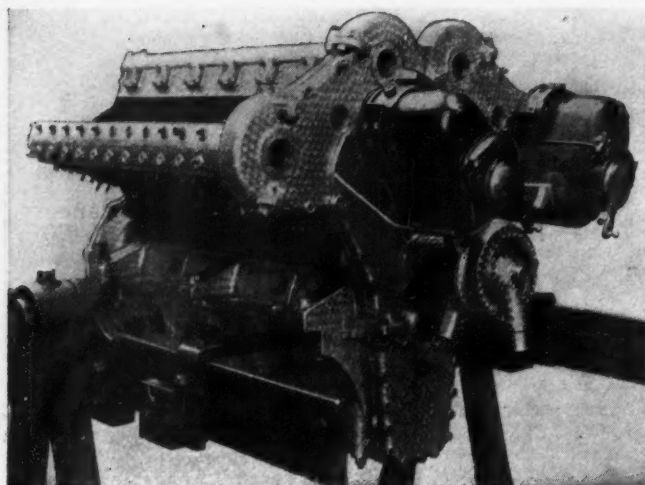
The Voisins have no chassis frame members. The body is built up in the same manner as an airplane fuselage, of wood, pressed steel members and sheet aluminum paneling. Two steel tubes give the necessary transverse rigidity and carry the powerplant, which, as explained, includes the radiator, all the brake control gear, and also, on the rear face of the gearbox, the housing for the spherical head of the torque tube. The power unit is secured at two points to the rear tube and at a single point on the front tube.

No differential is used. It was found necessary to guide the rear axle against lateral movement, and this was accomplished by means of two square section steel posts welded respectively to the upper and the lower faces of the axle housing and moving in two vertical guides built in the body of the car. Vertical movement of the axle, through the semi-elliptic springs, is unhampered, but by reason of the two axle posts and the guide it is impossible for the axle to move laterally.

It was expected that Voisin would completely inclose the drivers. This was not done, but they were placed so low that they offer practically no resistance. The portion of the body in front of the driver slopes down to the entering wedge, and that to the rear of the men is slightly above their heads. The gasoline tank is carried behind the crew, and the spare wheel is in the tail. It had been intended to inclose the front axle, springs and



Rolland - Pilain eight-in-line poppet valve engine and some of its parts. Crankshaft is built up from thirteen parts and has five main ball bearings and roller bearings on crank pins. A magnesium piston and tubular rod, designed to receive the roller bearing on its big end, are employed



Twelve-cylinder Delage 122 cu. in. racing engine. Cylinder block and seven-bearing crankshaft are shown at right

shock absorbers, but lack of time made it impossible to do more than streamline each member.

The oil tank is in the entering wedge, in front of the radiator, which stands out slightly above the level of the body. The engine base chamber is dry. The total height of the cars is 40 in., while the clearance is less than 6 in., only just sufficient to enable the cars to run on the road without striking if a tire is shed.

The front axle is of the normal type and is attached by semi-elliptic springs with the shackles at the front end. The steering gearbox is bolted to one of the uprights of the body frame. The column is practically horizontal and the top of the steering wheel is just below the line of the body.

These were among the lightest cars in the race, coming just within the weight limit of 1433 lb. While the general design tends toward lightness, the fact that construction throughout follows much more on aviation than on automobile lines, with an immense amount of steel tubing, light steel pressings, acetylene welding, aluminum and duralumin parts, tends to a reduction of weight. It is claimed that one of the normal 10-hp. Voisin chassis was experimentally streamlined like the racing cars and the speed increased from 60 to 85 m.p.h.

Rolland-Pilain

Rolland-Pilain this year is racing with the eight-cylinder models which ran a year ago. The positive valve operating mechanism has been abandoned, however, in favor of the conventional system of closing by coil springs. Steel liners inside the aluminum cylinders have been replaced by iron liners, and magnesium pistons are used.

The engine has 59.2 mm. bore and 90 mm. stroke. Unlike the others, an iron detachable cylinder head is used. This is bolted to the aluminum casting carrying cylinder barrels and crankshaft. With the two valves per cylinder inclined in the head at 45 deg. and the aluminum housings carrying the camshafts, the engine looks externally like a V-type.

The built-up crankshaft is made in thirteen parts, assembled by conical joint. It is carried in five S. R. O. ball bearings and has roller bearings in cages for the connecting rods. These latter are tubular, with split ends united by two bolts. The camshaft drive is at the front by spur pinions. Last year battery ignition was employed, but this year use is made of a Scintilla magneto mounted crosswise and driven from the front end of the exhaust camshaft. Four Zenith carbureters are used.

Engine and gearbox are a unit, attached at three points to the frame members. A peculiarity of the rear end is that the axle is above the frame members, these latter having a downward slope toward the rear. Track is 44 in. at the rear and 51 in. at the front. Rolland-Pilain is making use of four-wheel brakes with hydraulic operation at the front and mechanical control at the rear, the four, however, being controlled by one pedal.

The decision to race having been taken at a late date, Delage entered only one car, with a 12-cylinder V-type engine. Two different types of engines were built, one having roller bearings for the crankshaft and the connecting rods, the rollers being in direct contact with the shaft, as in the case of Fiat and Sunbeam, and the other with plain bearings throughout.

Delage

The Delage twelve is really a double six with two cast cylinder blocks mounted on an aluminum base chamber at 30 deg. from the vertical. The cylinder blocks are staggered in relation to each other to permit mounting the connecting rods side by side, and the crankshaft, which is machined from the solid billet with circular webs, is carried in seven roller bearings.

The cylinder core is 51.4 mm. (practically 2 in.) and the stroke 80 mm. (3.15 in.). Two valves are inclined in the cylinder head at an angle of 42 deg, with center line of cylinder, while the spark plug is mounted centrally. Screwed-on duralumin water jackets have been adopted, not only to decrease weight but to aid in securing uniformity of the cylinder walls and an examination of the water space around the valve seats and spark plugs.

Roller bearings are used not only for the main shaft but for the connecting rods, which are of I-section with two bolts. Aluminum pistons with three steel compression rings are employed. The engine has four camshafts carried in ball bearings, each shaft being mounted in an aluminum housing bolted to the cylinder head, and the valves being operated through light followers. Camshaft drive is at the front end, through a train of spur pinions on ball bearings and carried in an aluminum housing. The double centrifugal water pump, giving a direct flow of water to each cylinder block, as well as the two magnetos, are driven from the front end. Lubrication of the engine is under pressure to the main bearings and through the drilled shaft to the connecting rod bearings. There is a feed pump and a scavenger pump, and all the oil is contained in a tank independently of the engine.

Facts Often Explode Business Myths

Charts Not "Highbrow Stuff"; They Are Pictures of Things Which Have Happened

By Harry Tipper

"I EXPECTED our production schedules would be cut a bit before this, Jim," said John Carter, the manufacturing head of the Planet Motor Car Company. "Of course, we're running a little lower than we did in June and that was off a little from the peak, but the way those closed models are going through the plant you wouldn't think it was summer time."

President Billings of the Planet Company, his sales manager and his principal manufacturing executive were at lunch together. A few of the more important men in the company had formed this habit several years previously and a large round table at the club tacitly was reserved for them every day.

They found it convenient to keep up the practice, although the conversation was by no means confined to business.

Carter had no idea of starting a business discussion; his main purpose was to break up a golf argument.

"Well," replied James Chance, the sales manager, switching easily from the golf game, "I did expect to see a bigger slump than this myself. In fact, I hardly dare talk about it without knocking wood; the luck might break. By rights we should be getting a slump—that's the history of the business since I've been in it, and I've been mixed up with it since almost the beginning."

"You may be right, Jim," chipped in the president, who had been on the opposite side of the golf argument and was still inclined to disagree, "but I think your memory's pretty punk. I don't believe there's any reason in past history for the 'summer slump' myth. It's about as correct as the rest of the current myths that are so largely accepted."

"How do you get that way, chief? You know that my statement will be confirmed by men, all over the country, who have been in this business a long time and should know it—if anyone does."

"Of course, that doesn't mean anything to me."

"YOU'VE heard these old fellows talk about the climate when they were boys, the deep snow and cold in the winters, and the summer heat, etc. Everyone will agree that the climate has changed almost beyond recognition. Why a few years ago when we had a winter that was a little more open, about a dozen of these fellows, at different times, recited chapter and verse on the changes of the climate since they were children."

"In fact they began to get my goat after a while and I made up my mind to either check them up or quit the argument. So I sent down to Washington for information about the temperature averages for about fifty years back. Say, if you could find any changes in climate from looking at those figures you'd be a partner to Houdini."

"Nothing doing. One year would get a record for cold in December, another in January, and so on, but when

you figured the average temperatures for the different months they were hardly off at all, and in many years you couldn't see it. Furthermore, some of the recent years were just as bad as those fifty years ago and brought in just as many records.

"No, sir. Those fellows just remembered the high spots, the few things that stuck in their minds, and they tried to tell me that the whole year was made up of that kind of day."

"You'll get what I mean, Jim, if you call to mind that production chart in AUTOMOTIVE INDUSTRIES of June 7. Did you see it?"

"No, I don't read that part of the paper," Chance replied. "When I get through the news I've about used up all the time I have and I don't seem to get the hang of that highbrow stuff. Can't make it apply to our case. I guess they're all right if you're an engineer like John here and used to reading the stuff, but you have to be brought up that way."

"THAT'S where you're wrong again, Jim," returned President Billings, who was still in an aggressive mood. "I used to feel like that till I got the idea that charts are pictures of activity—drawings of what we have done—a general plan of what has occurred and what is likely to occur again. Like the drawings John gets up for our discussions about new models."

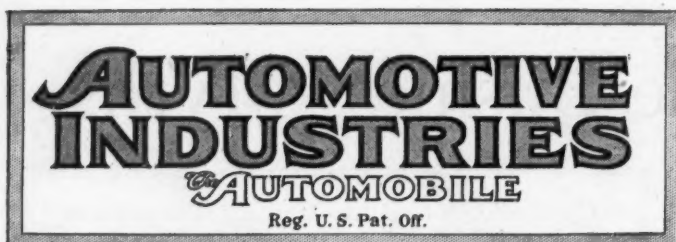
"That chart I spoke about was a picture of the production of automobiles by months each year from 1913, and I got a lot of good from studying that picture. I guess I picked it up twenty or thirty times in three days and got a new question in my mind each time."

"You look that chart over and you'll have a hard time finding that summer slump you're talking about."

"That may be," said Chance. "I didn't see the chart so I can't say what it shows, but I do know that we always figure on a 25 per cent or 30 per cent slump in the summer and we were almost always right."

"Probably, Jim, but did it ever occur to you that the reason you got it was because you figured on it? Somebody was selling cars during that time, otherwise there would be some deeper valleys on that chart in those months each year. There are hills and valleys, but they are not regular and they are not very great, except during depressions. They do not show any regular summer slump at all. Then, again, the production curve is changing from what it was. Closed cars, better winter conditions, more roads and cars are changing the situation."

"This industry is getting older. It's almost reached its strength and it doesn't act as it did. No, sir! If you ever feel inclined to pay any attention to the summer slump myth, look over the charts—see the pictures and make up your mind that some manufacturers are selling cars because people are buying them, and we might as well get in on that business."



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Focusing Engineering Interest

TWO technical subjects are absorbing the chief interest of engineers at the present moment; large section tires and four-wheel brakes. Considerable difference of opinion exists regarding both of these developments, as is indicated by the sentiments of leading engineers expressed on other pages of this issue.

Representatives of the United States and Firestone tire companies differ somewhat in their general attitude toward the new balloon tire. S. P. Thatcher of the United States organization believes these tires have good possibilities, but points out certain important disadvantages. J. E. Hale of Firestone, giving the results of tests made during recent months, is more enthusiastic about the new development. Discussion of Hale's paper at the S. A. E. meeting in Spring Lake brought out several other points of view.

The four-wheel brake is about to be subjected to its first real commercial trial in the United States.

The production and price competition met in Europe by cars equipped with four-wheel brakes is less severe than that encountered here. With an installation on one high-priced and one middle-priced car, however, the new brakes will get a good test. As time goes on further refinements in the mechanism are to be expected, while American commercial needs will undoubtedly give birth to production methods which will permit four-wheel brakes to be added without material increase in cost.

Centering engineering attention on a few points from time to time makes for a healthy growth in design practice. When many companies are interested in an engineering subject its commercial and technical development is certain to be accelerated. The widespread interest in turbulence and detonation generated through the visit of H. R. Ricardo to America last year resulted in a considerable spread of knowledge concerning these phenomena. Current attention to large section tires and four-wheel brakes seems likely to have a similar effect on these features of design.

Automotive Literature

BASED on a new mechanical invention, the automobile industry naturally developed a technical literature before any extensive writing was done about its more general phases. Special books have been written concerning almost every phase of design and repair of the passenger car, truck and tractor. These technical works range all the way from P. M. Heldt's authoritative volumes on "The Gasoline Motor," designed for the trained engineer, to semi-popular discussions intended for use by mechanics and owners.

More recently, however, a general literature of considerable merit has been growing up, dealing with important phases of automotive development other than the vehicle itself. The volumes which comprise this new literature are coming faster every month and seem destined to contribute marked benefits to the progress of the business.

Several books about truck transportation have endeavored to put into logical arrangement the meager facts already known concerning this important subject, and by so doing have rendered a real service to truck manufacturers and salesmen. A few volumes have been prepared to help the dealer and his salesmen do their jobs better. Highways have been the subject of one or two excellent discussions, while the automobile industry even broke into fiction not very long ago.

A more extensive and complete business literature will be beneficial to manufacturers. The books so far written necessarily have been somewhat elementary in character, except those dealing with mechanical subjects. Production, the outstanding achievement of the automotive industry, has not yet been treated in book form. Marketing, from the standpoint of the manufacturer, is another subject thus far neglected. Good reasons exist for lack of books on these latter subjects, and it may be well that treat-

ments of them have not yet been put into permanent bindings. Production has been making such rapid strides that weekly discussions have been necessary to keep pace with its developments, while marketing practice has been standardized to so limited an extent that it has not adapted itself specially to appearance in book form.

The literature of the automotive industry has been developed chiefly by executives within its own ranks. It is worth encouraging for its future possibilities as well as for its present merits.

Determining the Optimum Grade

AT the present time a great deal of regrading of roads is being done in connection with the laying down of tar-macadam and concrete pavements, and as the bulk of the traffic over these roads will be motor-propelled, the question has arisen as to what constitutes the most advantageous grade for motor traffic. In the State of Michigan extensive experiments have been carried out with a view to determining the tractive resistances on different grades under various conditions of speed, etc., and thus to throw light on the problem referred to.

In railroad work grades are cut down to very low values, because the coefficient of traction for smooth, heavy rails is very low, and if the grade exceeded, say 1 per cent, a great deal of the potential energy stored up in the train during the ascent would have to be dissipated at the brakes during the descent. Besides, heavier engines would be required to pull the trains up the grades.

With automobiles the conditions are somewhat different, because these have a multiple gear reduction, and if the grade proves too steep for one gear the operator can change to a lower one. Making exception of the comparatively few tractors now on the roads, the motor vehicle has to propel only its own weight, and as it is equipped with rubber tires, which have a high coefficient of adhesion on all ordinary forms of dry pavement, there is rarely a serious lack of traction on any grade which would be considered in road building. The problem that confronts the road builder therefore is really one relating to the grade or grades permitting of the most economical operation of cars.

In ascending a grade a certain amount of energy is stored up in a car and in descending this energy is used either partly or entirely for propulsion. If the grade is too steep the brakes must be applied during the descent, and in that case some of the stored energy is converted into heat and thus wasted. This waste of energy is not the only loss, because the brake linings are worn away and thus the expense is further added to. Therefore, a very desirable grade is that one which permits a car, with its clutch thrown out, to coast at practically uniform speed. On such a grade nearly all of the extra energy consumed in ascending is turned to useful account during the descent of the vehicle.

Of course, the minimum grade on which a vehicle will coast differs with the construction of the vehicle, with the type and degree of inflation of the tires and

with other factors. The form of pavement also has an influence, and experiments should be carried out to determine for each type of pavement the minimum grade on which different types of vehicle will coast. Obviously such a grade should be chosen for the roads that all or practically all cars would coast on it without losing speed. The grade required would probably lie between 2 and $2\frac{1}{2}$ per cent. It is not meant to convey the idea that no steeper grades than this should be employed on highways, but, rather, that such a grade presents decided advantages from the standpoint of economical operation and should be chosen where the difficulties of construction are not too great. Cutting down grades adds materially to the cost of highway construction, but in this connection it must be remembered that the benefits are perpetual.

Owners Say, "Scrap Used Trucks"

IF truck owners would scrap their old vehicles instead of trading them in, the used truck problem would lose much of its seriousness. Manufacturers might be expected to advocate such a practice, but to find an owners' organization proposing it is surprising. Yet the idea has a sound basis from the standpoint of the truck user, as is shown by the arguments in its behalf presented last week at the Milwaukee meeting of the National Team and Motor Truck Owners' Association.

Proponents of the plan consisted chiefly of men operating fleets of trucks for hire; men who make their living by selling transportation. These operators were in almost complete agreement and said something like this:

"A truck dealer makes a big allowance on a used truck in order to sell a new one. Then he sells the used truck at a ridiculously low price just to get rid of it. The man who buys the very cheap used truck too often is an irresponsible individual who has little knowledge of truck operating costs or methods. He goes out and sells transportation at less than cost and finally fails, only to be replaced by some one like himself who has been able to get into business by purchasing a cheap second-hand truck.

"The result is demoralization in the truck transport business. Legitimate, responsible operators find it difficult to get trade and the whole truck transport idea suffers through the poor service given by irresponsible operators. Such owners, also, increase the complexity of many of the traffic and safety problems which confront the country.

"Legitimate truck operators would be better off if they ran a vehicle until it had outlived its economic usefulness and then scrapped it. The used truck is a worse menace to the profits of the truck transportation company than it is to the truck dealer."

There is much logic in this argument. It was received with general favor at the truck owners' meeting. Whether it will be put into practice remains to be seen. The truck manufacturer should recognize clearly, however, the attitude toward the used truck which is now being taken by some of his very best customers.

INDUSTRY SHOWS SOUNDER FOOTING

THE economic condition in the industry is better, although sales show a slight falling off in general.

The weak spots are:

- (1) Prices of raw materials.
- (2) Weakness of stocks.
- (3) Small profit in volume among dealers and manufacturers, in many instances.

The improvements are:

- (1) Much better credit and considerable reduction of outstanding manufacturers' notes.
- (2) Continuation of sales on a good plane.
- (3) Comparatively low inventory.

Raw materials prices dropped 2 per cent in the month, but general commodity prices experienced an equal decline so that the raw materials in this field still show prices considerably in excess of the general price demands.

Stocks continued their downward movement during the month, although there is no warrant for this condition in the activity of the business.

Many other factors enter into the calculation of the financial buyer, so that the weakness in the stocks is not a true reflection of the industrial position within the field. It reflects the opinion of the financial buyer as to

the probable tendency in security values in view of the external and internal economic conditions.

The most serious weakness is the smaller profit accruing to many companies for the volume of business done. This condition prevents the showing in stocks and in surplus that should accompany big activity such as the industry has enjoyed this year.

These difficulties are offset by the improvements in credit, particularly in the increased payment of notes to parts companies and other suppliers. Reductions in this respect show a large gain in payment of outstanding indebtedness. The sales position continues good. There is a slight falling off from the May records, but the volume is holding up in very remarkable fashion.

Inventories are being kept down and the general position of the manufacturer is excellent.

Dealers are not making as much profit as the volume would warrant and this weakens the distributing efficiency in the retail end of the business to some extent.

The situation is improving, but a good deal remains to be done in this respect.

In general the outlook is good and there is no visible reason for considering anything but good business through the season.

Conditions in chief distributing centers as reported by correspondents of AUTOMOTIVE INDUSTRIES are as follows:

Sales Reported on Good Plane in Many Sections of Country

Boston

BOSTON, July 3—New England continues to absorb motor cars readily, according to reports of motor dealers here. Averaging up the statements from among the entire group here is about what it sums up. There seemed to be a "seasonal" letup in New England earlier than usually happens, but it did not last. The first week in May saw a falling off in orders, then the month picked up and continued along good lines.

The same thing happened in June, and some of the dealers felt that it presaged a general letup. But it did not. Orders came in again at a plentiful rate. That is for the general run of cars that have been well advertised.

Some of the dealers in the higher priced field expect that the exodus to Europe will slow up their sales from now on. In cars priced under \$1,000 the dealers can show scores of unfilled orders, particularly closed jobs.

Some dealers are holding down their used car departments, putting a limit to the value of their stock. This has held up sales, but not to any great extent.

New England has no farming element to sell in large numbers, but what there are have been making some money so they will begin buying now that they are catching up with the backward season in ripening and selling crops. Sales for the next few weeks should begin to show a tapering off due to the vacation

season having started, and many persons having bought cars in anticipation of their trips.

New York

NEW YORK, July 3—Although sales in the Metropolitan territory for June showed a slight tapering off in demand, dealers here are optimistic over the brighter prospects indicated by the record of the past 10 days. The latter half of June developed a somewhat unexpected upward trend in sales and while the month as a whole was below May, July is expected to hold strong for two or three weeks. For some dealers July probably will top June in deliveries.

The increase in demand was particularly discernible in the medium and lower price fields but not altogether absent in the higher price class. An interesting development in the medium and lower price classes was the indication of a return to favor of the standard open car, and somewhat of a slackening in the popularity of the sport job.

The open car market has been particularly active and while there has been some accumulation of used cars the situation on the whole is particularly good. Most of the dealers are still carrying smaller used car inventories than a year ago.

Truck sales have continued stronger and are expected to develop considerable momentum during the summer and fall.

Birmingham

BIRMINGHAM, ALA., July 3—Sales of cars during June were off to an extent over the preceding five months, but were still considered excellent and not down to the low predictions for the summer.

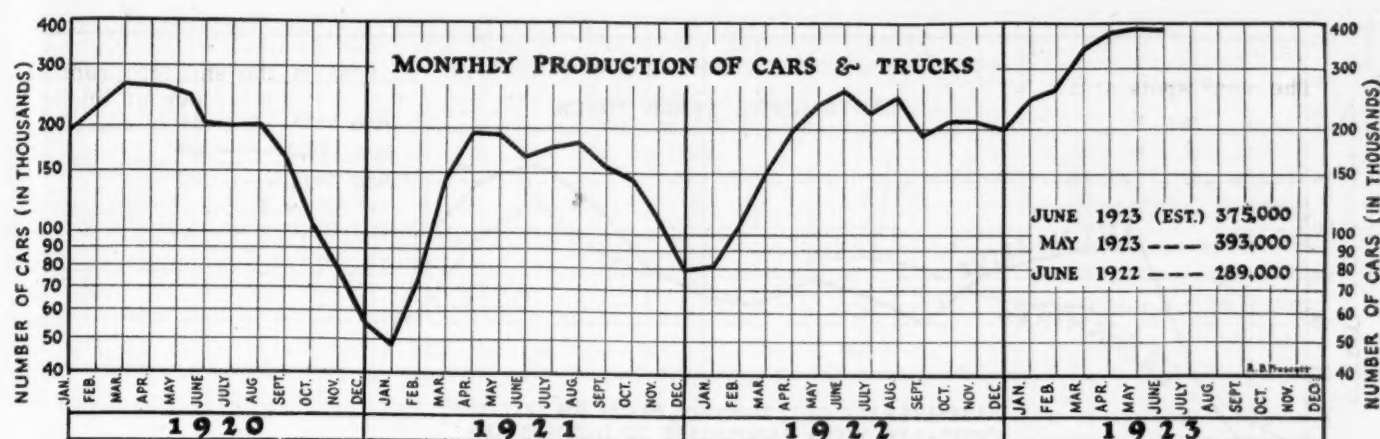
Weather conditions throughout this section of the South have been good for the cotton farmer during the entire month of June. The farmers have been putting in a great deal of hard work and the crops in this section are more advanced than was thought possible after the five weeks of rain during April and May.

The labor shortage is causing considerable worry in the farming sections, however, and the farmers are not inclined to buy automobiles or anything else until the crop is further on its way and they can see what to expect.

Sales prospects for July are not up to what they have been during the past six months. This is due to the summer slump, which is always expected; to the fact that the farmers are attending strictly to their crops; and to a feeling of unrest among the lumber and other interests furnishing building materials.

Sales in the large towns and cities of this section and especially in Birmingham proper should be excellent; in the rural sections they should be far below average for the past six months until after the cotton is coming into the gins. (Conditions in other cities on page 39)

JUNE OUTPUT ESTIMATED AT 375,000



In Half Year Total of 2,024,054 Trucks and Cars Were Built

NEW YORK, July 5—Seventy-six per cent more cars and trucks were produced in the first half of 1923 than were manufactured in the first six months of 1922. So far this year 2,024,054 have been produced as compared with 1,150,983 in the same period last year.

This total is secured through the production of 375,000 motor vehicles last month, as estimated by the traffic department of the National Automobile Chamber of Commerce based on shipping returns for three weeks and estimating on the final six working days. This is a decline of 18,000 or about 4 per cent under May, the greatest month in the production history of the industry. The slump also drops June into third place in the record table, April still being second with 382,001.

The June estimate of 375,000 does not surprise those who have been waiting for the usual seasonal slump. Some thought it would come a month previous, but to the surprise of all the industry started out in June as if it intended to exceed even the record month of May. For the first two weeks production kept up the pace of the same fortnight in May, but in the third week there came a falling off of slight proportions which became more pronounced the last week. Ford held up to May with his 171,000.

In the way of explanation of the drop, part of it may be ascribed to some of the larger factories slowing down the last week for "cleaning house;" that is, preparing for the introduction of new models, which always means a tapering off in production near the end of the run

Estimate of Production Last Month Shows Decline of 18,000 as Compared with Output of Factories During May

New York, July 3—Shipping figures compiled by the National Automobile Chamber of Commerce for June give an estimated production of 375,000 cars and trucks, a falling off of about 18,000 from May, the record month.

The following table gives the statistics for the first six months of this year and for the months of 1922:

	Output		Carloads		Driveaways		Boat	
	1923	1922	1923	1922	1923	1922	1923	1922
January	243,104	91,109	35,223	15,357	30,027	7,479	728	143
February	276,467	122,366	36,147	19,636	43,600	10,173	882	180
March	354,319	172,720	44,372	27,758	62,656	16,917	1,940	560
April	382,001	219,558	44,977	31,334	59,522	22,381	4,869	2,960
May	393,163	256,219	46,100	33,416	60,550	28,827	12,050	7,406
June	375,000	239,011	42,500	34,230	58,500	33,857	14,000	7,737

Factory shipments for the other months of 1921 and 1922 and output for 1922 follows:

	Output	Carloads		Driveaways		Boat	
	1922	1921	1292	1921	1922	1921	1922
July	246,607	19,514	29,116	15,533	28,100	3,726	7,030
August	272,589	20,758	32,814	15,218	36,754	3,595	10,096
September	206,849	19,002	25,950	13,840	30,055	2,959	8,002
October	237,611	17,808	26,980	12,971	33,326	2,226	7,040
November	236,887	14,264	27,232	10,528	27,376	1,402	5,070
December	227,319	12,100	26,900	7,500	27,560	134	1,300

Motor vehicle production segregated as to cars and trucks is as follows

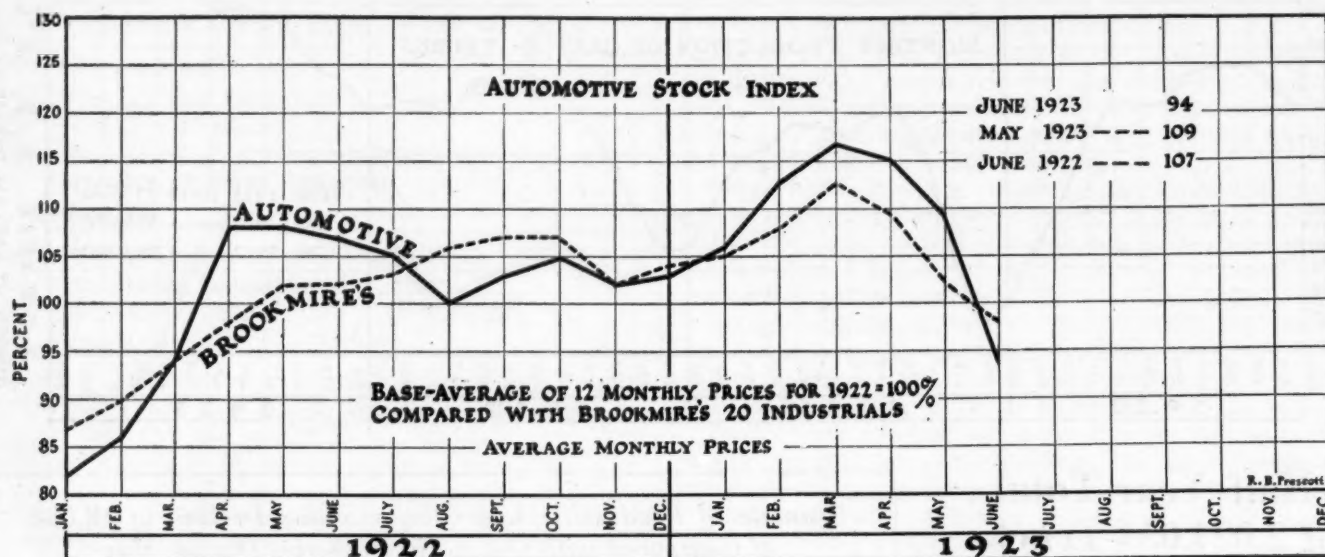
1922			1922		
	Cars	Trucks		Cars	Trucks
January	81,693	9,416	November	215,284	21,603
February	109,171	13,195	December	207,269	20,050
March	152,959	19,761			
April	197,216	22,342			
May	232,431	23,788			
June	263,027	25,984			
July	224,770	21,837			
August	248,122	25,467			
September	187,661	19,188			
October	216,099	21,512			
*Estimated					

in order to have clean shelves for the newcomers. It is more than likely that the decline will be even more apparent in July and it would not be surprising to see as decided a difference between June and July as occurred last year when there were 43,000 fewer cars and trucks built in July than in June.

Truck production in June has not

slumped any, according to the estimates made, and it is expected that when the final count is made it will be found that at least 44,000 commercial vehicles were turned out, showing a gain over May, when approximately 43,000 were built. It is felt, too, that trucks will continue to show production gains for several months to come.

LEAD LOST BY AUTOMOTIVE STOCKS



Quotations on Exchange Show Movements of Stocks

New York Exchange

	June 5	July 3
Ajax Rubber	11 1/4	6 3/4
American Bosch	37 1/2	29 1/2
American La France	11 7/8	10 3/4
American La France pfd.	95	95
J. I. Case	34	34
J. I. Case pfd.	79	70
Chandler	60 1/4	46 1/4
Continental Motors	9	6 7/8
Electric Stor. Bat.	60 3/4	53
Emerson-Brantingham	3 1/8	2
Emerson-Brantingham pfd.	15	15
Fisher Body	150	140 1/2
Fisher Body of Ohio	98 1/2	94
Fisk Tire	11 1/2	11
Gardner Motors	10	8 3/4
General Motors	14 5/8	13
General Motors pfd.	83 1/2	80
General Motors 6%	83	81
General Motors 7%	99 7/8	95 5/8
Goodrich, B. F.	30	30
Goodrich, B. F. pfd.	89 1/4	44
Goodyear Tire pfd.	54 1/8	79 1/2
Goodyear Tire pr. pfd.	96	94 3/4
Gray & Davis	72	72
Hayes Wheel	37 1/4	32
Hendee Mfg.	15	12 3/4
Hudson	25	20 1/2
Hupp	22	17 1/4
Inter. Harvester	82	76 1/2
Inter. Harvester pfd.	103 1/2	103 1/2
Kelly-S Tire	45	30
Kelly-S Tire 6% pfd.	80	80
Kelly-S Tire 8% pfd.	95	95
Kelsey Wheel	103 1/2	100
Kelsey Wheel pfd.	100	100
Keystone Tire	6 5/8	4 1/4
Lee Rubber	24 1/4	18
Mack Truck	79 1/8	65
Mack Truck 1st pfd.	93	85
Mack Truck 2nd pfd.	72 1/2	72 1/2
Marlin-Rockwell	8	7
Martin-Parry	32	27
Maxwell Motors A.	46	36 3/4
Maxwell Motors B.	16	10 7/8
Moon Motors	26	21 1/2

Mullins Body	19	14 1/4
Mullins Body pfd.	90 1/4	90 1/4
Nash Motors	97 1/2	91 1/2
Nash Motors pfd. A.	97 1/2	97 1/2
Packard	12 1/2	12 3/4
Packard pfd.	91 1/4	92
Parish & Bingham	11 3/4	9 1/8
Pierce-Arrow	11 5/8	6 5/8
Pierce-Arrow pfd.	16 1/2	15 1/2
Pierce-Arrow pr. pfd.	66	59 1/2
Reynolds Spring	22	14
Spicer Mfg.	17 1/4	12
Spicer Mfg. pfd.	90	90
Stewart-Warner	89 3/8	75
Stromberg Carburetor	71 5/8	60
Studebaker	112	98 3/4
Studebaker pfd.	110	110
Timken Roller Bearing	38 3/4	35
U. S. Rubber	50 1/4	50 1/4
U. S. Rubber 1st pfd.	99 3/8	94
White Motor	51 5/8	45 1/2
Willis-Overland	6 5/8	5 7/8
Willis-Overland pfd.	62 1/4	61 3/8
Wright Aero	10 1/2	9 1/2

New York Curb

	June 5	July 3
Cleveland Motors	25 1/2	25 1/2
Durant Motors	51 3/4	51 3/4
Durant Motors of Ind.	12	12
Eaton Axle & Spring	26	26
Ford of Canada	440	420
Goodyear Tire	14 1/4	10 1/2
Mercer Motors	74	74
Motor Wheel	11 1/4	11 1/4
National Motors	1 1/2	1 1/2
Peerless Motors	41 1/2	32 1/2
Perfection Tire & Rub.	75	75
Reo	15 3/8	14 5/8
Stutz	16 3/4	13 1/8
Timken-D Axle	10 1/2	9
Willis Corp. 1st pfd.	7	5

Philadelphia

Electric Stor. Bat.	54 1/2	54 1/2
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Chicago

	June 5	July 3
Bassick-Alemite	36 1/8	31
Borg & Beck	29 1/2	25 1/4
Chicago Coach	90	90
Continental Motors	7 1/8	7 1/8
Gill Mfg.	18	18
Hayes Wheel	32	32
Hupp	17	17
McQuay-Norris	17 3/4	17 3/4
Reo	15 1/2	14 5/8
Stewart Motors	75 1/4	75 1/4
Stewart-Warner	90 1/8	74 1/4
Yellow Mfg.	264	252 1/4

Detroit

	June 5	July 3
Continental	9	7 1/8
Edmunds & Jones	34 3/4	34
Ford of Canada	436	408
Motor Products	99	99
Motor Wheel	9 1/4	9 1/4
Murray Mfg.	18 3/4	18 3/4
Packard	12 5/8	12 3/4
Packard pfd.	92	92
Paige	19	17 3/4
Reo	15 1/2	14 3/4
Timken-D Axle	10 1/8	9

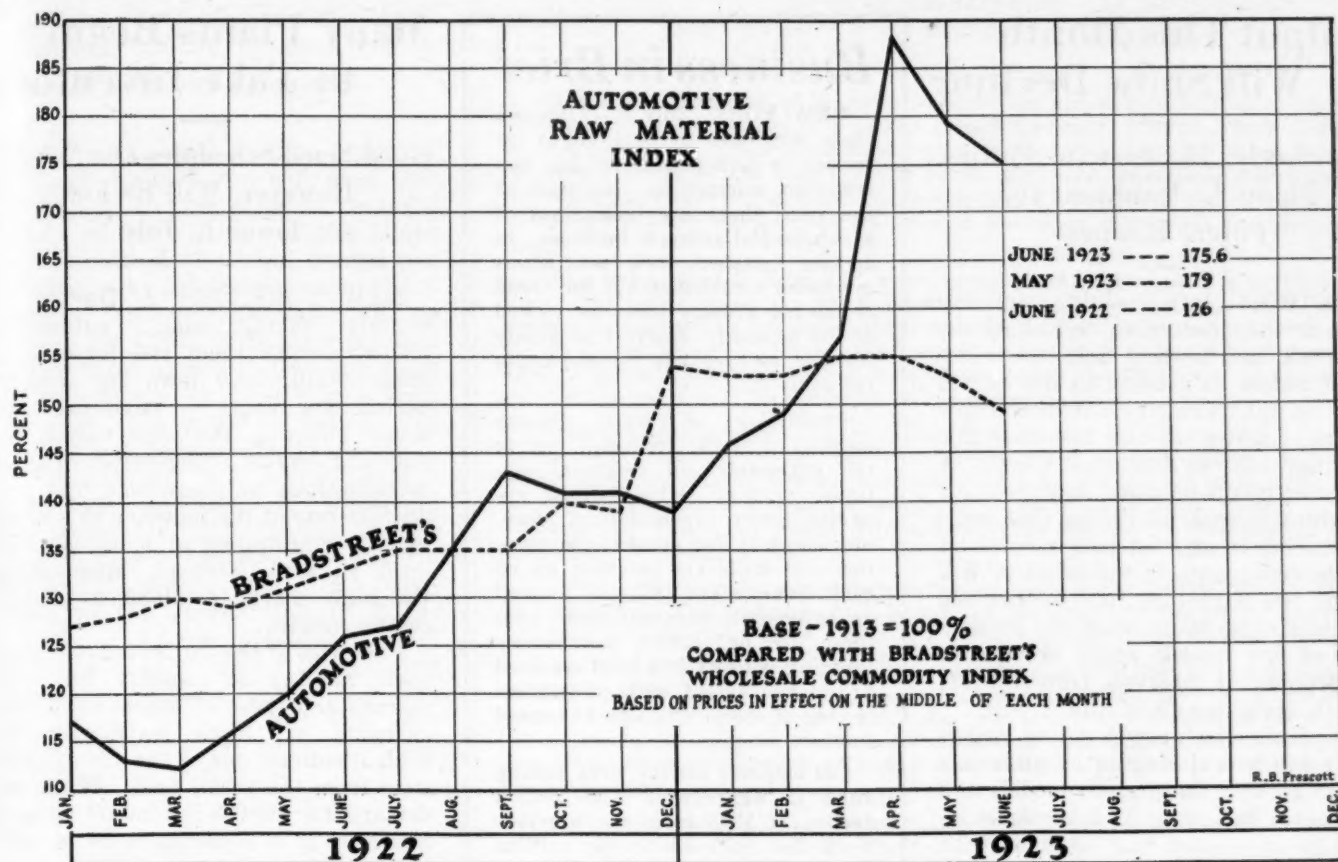
Cleveland

	June 5	July 3
Firestone	70	70
Goodyear	14 1/4	10 1/2
Goodyear pfd.	54 1/4	54 1/4
Jordan pfd.	86	86
Miller Rubber pfd.	103	103
Peerless Motor	42	33 1/2
Stearns, F. B.	20	20

Boston

	June 5	July 3
Gray & Davis	10	10
Gardner	9	9
Greenfield	16 3/4	16 3/4
Hood Rubber	54	54

DROP CONTINUES IN MATERIAL COSTS



Conditions Among Farmers Have Important Bearing on Sales

Kansas City

KANSAS CITY, MO., July 3—June was an extremely "spotty" month in the motor car business, with some firms showing a heavier volume than in May on both closed and open models, and other firms showing sharp declines. Used car sales were lighter than in May which declined from April.

As a rule the heavier volume of business proportionately is in the cities, the farmers being overwhelmed with work on wheat harvest, laying by corn, etc., and also being depressed in spirits by the low return for wheat in the face of the high cost of labor. Some of the small cars are selling very well in farming communities.

A complication still prevailing, making it difficult to analyze actual conditions, is the shortage of closed cars. This has caused heavier effort on sales of open cars, with consequent change in the proportion of apparent demand. There have also been "over deliveries" of open cars, dealers receiving more than they really expected, forcing them to strenuous action to move them.

In general, July looks like a very slow month in country trade, and a fair one only in city trade, with closed models selling readily in the cities, open models

selling fairly well because pushed, and used cars slow. The influence of the temporary depression in agricultural districts will reach the cities quickly; but business men are predicting good trade in most lines for the fall.

Bankers are said to be holding dealers down rather more tightly right now than they have in the past.

Atlanta

ATLANTA, July 3—Automotive sales in the Atlanta territory have shown little or no abatement the past month. Registration figures at the State Capitol show sales unusually good this year in the rural districts throughout Georgia, and most dealers express the opinion this business is at least 100 per cent better than at this time last year.

The crop outlook is excellent, with a normal cotton yield in promise, and the price holding firm near 30 cents. At this price it will be the biggest year financially in the history of the cotton industry in the South.

Commercial truck sales have been increasing steadily since the first of the year all over the South, distributors state, due to the improved industrial conditions in the district.

Columbus

COLUMBUS, OHIO, July 3—While there has been a falling off in the demand for some lines of cars, the demand as a whole in central Ohio territory is holding up well. Dealers in the cars ranging up to \$800 are experiencing a strong demand and in most cases it is a question of getting deliveries rather than in making sales.

In cars ranging from \$800 to \$1,800 there is a good demand but the strength of the earlier season is lacking. But there is no accumulation of cars of that class especially and dealers are generally satisfied with conditions.

In cars above the \$1,800 price the demand is fair and sales are good as a rule.

Used cars are not as active as formerly and there is quite an accumulation of cars.

Farmers are expecting a good harvest and are looking around to make purchases. In fact a number of dealers have orders for delivery after harvest. Crop conditions in central Ohio are generally good although the season is somewhat later than usual.

(Conditions in other cities on pages 50 and 51)

MAKERS PREPARING FOR NEW MODELS

Output This Month Will Show Decline

Due Solely, However, to Putting
Plants in Readiness for
Future Business

DETROIT, July 2—July's contribution to the production record of the year will lack a great deal of the impressiveness as created in the earlier months, but its failure may be charged almost entirely to the necessity for sacrifice that the remaining months of the year might be made stronger. All of which is a way of saying that manufacturing in at least half a dozen of the largest plants in the industry will go by the boards in July so that the plants may be made ready for production of new models which are due to be popping at intervals from the fifteenth of the month to Aug. 1.

In plants which are changing models there will be a closing out of materials which go into the present models and a general balancing of inventories so that an even start may be made with the new goods. Work will be somewhat intermittent owing to departments being tied up between the time the old material is run off and the new is being started.

The situation tends toward a rather large falling off in output as compared with earlier months, but cannot be construed as indicating anything more than that new cars are coming out.

Ford Orders Continue High

Taking Ford as a barometer of actual demand in its class that company declares that its July orders from dealers run in excess of 300,000, the same condition that has existed for the last three months. Ford, however, cannot be taken as an actual barometer for cars in any other than the low-priced class, because of the large volume of business that cars in this division are getting from farm areas, whereas cars in the medium priced class generally are getting but a small percentage of business from those districts. In the medium priced field the bulk of the buying is coming from the cities, a large percentage from industrial workers, and executives declare that demand is running close to the point of the earlier year peak.

Better known companies which are not changing models declare July business will approximate that of May and June. Companies manufacturing cars that are not among the leaders in their particular fields, and which have experienced

Business in Brief

NEW YORK, July 5—Although there continues to be a slight recession in both production and distribution, normal for this time of the year, there are indications of a substantial summer business. In certain instances new maximums are being established but the trend is toward greater quiet as viewed at the moment. Interest is mainly focused on possible developments for early fall.

Production of steel, though showing a slight recession due to the extremely hot weather, continues at high levels without apparent heavy accumulation. Buying is chiefly for present consumption and mills are catching up on back orders. The railroads as well as automobile manufacturers continue to be active purchasers. Building activity has been resumed to a large extent with consequent buying of steel. Pig iron has eased further.

Car loadings for the week ending June 16 aggregated 1,007,253, a decline of 5996 from the previous week but still above the million mark. This gives strong evidence to the fact that trade and industry are maintaining a high level.

Intense heat in some sections and heavy rains in others have improved the crop situation and there is great activity in harvesting winter wheat. Grain prices have yielded to bearish sentiment and reached new low levels for the season.

Call and time money rates have advanced, the former reaching 6 per cent. During the first half of the week stocks and bonds suffered heavy declines due, no doubt, in large measure to the feeling of uncertainty regarding the future. Some recovery was made during the latter part of the week.

rather severe curtailments in business in the past month are facing a continuance of poor business through July. For the most part these are cars which enjoy only a limited popularity normally, but which get into large production from overflow business of the leaders.

Through the balance of the year there will be no overflow business for anyone, executives declare, but there will be plenty of good, sound business for those companies which have built good-will and have the sales organizations to go after the business. Leading companies declare

(Continued on page 49)

Many Plants Begin to Take Inventory

Good Sized Schedules as a Whole,
However, Will Be Followed in July

NEW YORK, July 2—Due to inventory taking many automobile plants, among them the major producers, will close down for a short period this month or next, this naturally affecting the total output for July and August. Regardless of these interruptions to operations, the production rate of the industry as a whole will be maintained at a satisfactory level without, however, approaching the high marks established in preceding months.

Factories of the larger makers have been running at capacity for some months and those of others have been carrying on along extraordinarily high schedules, due to the strong pressure from the retail field. While the demand for cars is not so active as it has been it is reported to be in sufficient volume to warrant plants operating on good schedules. Dealers in some sections have sufficient open models on hand to satisfy summer trade or meet the call during July at least.

The overhauling of plants will give manufacturers an opportunity for developing plans for future business and for production activities upon the resumption of operations.

Still Behind on Deliveries

Although producers are catching up on back orders for closed cars, they are still behind on deliveries. Body-building factories are moving along at top speed with enough orders on hand to insure capacity operations for some weeks to come. Moreover, from the present inclination of many car makers to devote more facilities to closed-car production in the future, such plants will continue to be among the most active in the industry.

Manufacturers are centering their attention on agricultural districts, many feeling that the peak of the demand in commercial centers is past for this year, and they are watching crop developments as a barometer of the buying power and disposition of the farmer. While cars are being sold in these sections, the full possibilities

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Wills Remains Head After Plant Is Sold

He and His Associates Made Purchase for \$750,000 and Will Reorganize Company

DETROIT, July 3—The property of C. H. Wills & Co. will pass into the hands of a new corporation to be known as the Wills Ste. Claire Motor Co. as soon as the legal formalities following the sale this week are concluded. The new company will be headed by C. H. Wills as president and general manager with the same active officers as now constituted. No change in price or models will mark the change in incorporation.

The company was sold without a competitive bid to C. H. Wills and associates for \$750,000, the associates in this connection meaning in general all persons financially interested in the reorganization of the company. Kidder, Peabody & Co., who acted as manager in bringing about the reorganization, made the bid on the property and will continue to act as manager until the new company is formed.

Capital Will Be \$5,000,000

Under the terms of the reorganization the new company will have a capitalization of \$5,000,000 in second preferred and \$400,000 shares of common stock. It is proposed to raise approximately \$3,000,000 in cash, to be used in part to cover the purchase and the balance to be turned over as working capital. In this connection it is stated that a large part of the new money will be available as working capital, as practically all creditors united in the reorganization plan.

Provisions as to different classes of stock briefly are: Prior preference and first preferred callable at 105; 20 per cent net earnings yearly, after dividends on above two classes, and second preferred shall be applied to retirement or prior preference and first preferred. No dividends shall be paid on second preferred or common stock, or funds used for retirement of any stock, if the net quick assets of the corporation are thereby reduced under \$4,000,000. All shares of stock both common and preferred shall have equal voting power.

Plans for Raising Cash

New cash will be raised as follows: Holders of the revolving credit totaling \$4,400,000 will buy prior preference stock to the amount of 30 per cent of their claims and will receive, in addition, an amount of second preferred equal to 50 per cent of the face amount of claims. This will give \$1,320,000 in cash.

Holders of first preferred in the former company participating in the plan will buy prior preference stock equal to

More General Use of Trailer in Conjunction with Truck Will Play Big Part in Highway Development

By H. O. MAINZINGER,
Sales Manager of the Whitehead & Kales Co.

Detroit, July 2.

FEDERAL supervision of highway construction and administration is essential to the development of highway transportation to a point where it will be in a position to render maximum service to the public. We are faced today, in many sections of the country, with conflicting state regulations which render it impracticable for trucks to operate in interstate hauling, and a large part of the work which trucks could do involves operation over roads in adjoining States.

In a recent visit to England I was impressed with the method of regulation there. By fixing speeds at which trucks variously loaded could operate, that country automatically regulated its truck and load weights, and left entirely to the discretion of the carrier the method of operation he could best pursue. Injury to roads was nullified by holding the heavy trucks to low speeds and permitting the lighter trucks much faster operation.

This method of regulation would serve admirably in this country to curb damage to roads caused by heavy trucks operated at high speeds, and by being made national in scope would permit trucks to load for transportation to any destination. A national engineering board with fixed standards of construction should be vested with authority to control the building of all important highways.

The trend in highway transportation is toward the lighter trucks used in combination with trailers. In England and the Continent the trailer already occupies an important place and it is coming into use in this country rapidly.

Failure of the trailer to come into extensive use in highway transportation in the past has been due largely to lack of understanding between truck and trailer manufacturers. Even to this day we have many trucks on the road which cannot be adapted for use in conjunction with trailers, but the day is very close when every truck will have to be designed with the probable use of trailer in mind.

Industry throughout the United States is becoming more alive all the time to the possibilities of highway transportation and it is important for truck and trailer manufacturers to recognize this and do everything possible to further it. Manufacturers in many lines are studying the transportation situation, and as the larger of these are convinced of the economies of truck and trailer operation, we may expect to see a wide development in their use.

By the use of trailers much of the prejudice against highway transportation in the past will be overcome. Automobile owners have been responsible for a large part of this because heavy, slow moving trucks have interfered with the faster traveling vehicle and have been charged with destruction of roadbeds. By spreading the loads formerly carried on the big trucks over one or more trailers with a lighter and faster truck hauling, the road wear will be reduced to minimum and at the same time much faster speeds can be maintained.

Depreciation on the big trucks has also had an important effect in holding back the general development of highway transportation. Truck operators are learning rapidly that much of this can be overcome by the use of trailers and their investments held to much lower figures. Considering all the features of the situation it is practically certain that the big developments in the highway field which are now approaching will be based upon a much more general use of the trailer.

30 per cent of the par value of stock held by them, and will receive, in addition, second preferred equal to 40 per cent of stock. This will give \$600,000 in cash.

Creditors, both merchandise and banks, with claims aggregating \$4,000,000, will receive first preferred equal to the face of their claims.

The sale of \$587,000 in prior preference, \$51,000 second preferred and 300,000 shares of common for \$1,925,000 has been arranged.

If all holders of revolving credit liabilities and first preferred make payments as outlined, the new money raised will be \$3,845,000. The sum of \$2,855,000

is assured. If all creditors also participate, the original issue of stock in new company will be \$2,507,000 prior preference; \$4,000,000 first preferred, \$3,051,000 second preferred and 300,000 shares of common.

The sale was held in the presence of a small gathering, mostly factory employees, at Marysville Tuesday. Kidder, Peabody & Co. was represented by C. M. Brewer. Wills was the center of a congratulating group immediately after. It was noticeable that the work at the plant continued undisturbed while the sale was in progress, and fifteen minutes later

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Peerless Has Earned Dividends for Year

Orders Payment at Meeting That Elects New Directors from Cleveland

CLEVELAND, July 3—George A. Coulton, senior vice-president of the Union Trust Co., Fred R. White, capitalist, and Victor W. Sincere, general manager of the Bailey Co., and president of the National Department Stores Co., were elected to the board of directors of the Peerless Truck & Motor Co. at a meeting held here. The board, in addition to these directors, now consists of R. H. Collins, president; G. H. Layng, W. H. Collins, John F. Porter, F. A. Trester, C. E. Sullivan, H. A. Tremaine and D. A. Burke.

In view of the fact that the dividends for the year had been earned, it was voted to declare them at the rate of \$1 a share for the last two quarters of the year, one to be paid on Sept. 30 to stock of record of Sept. 20 and the second to be paid Dec. 31 to stock of record of Dec. 20.

Collins stated that as the stock of the Peerless Truck & Motor Co. for a number of years has been an attractive investment for many Clevelanders, "we thought it advisable to invite further leading business men of this city to sit on the Peerless board. We therefore asked Mr. Coulton, Mr. White and Mr. Sincere to sit on the board, and I am very glad they consented to do so."

Collins said that the earnings of the company for the first five months were more than double those of the corresponding period last year, and were even in excess of the earnings for the first eleven months of 1922.

The company's financial condition and its position regarding new and used cars were discussed in a very optimistic vein by some of the board following the meeting. The records disclosed the number of new and used cars on hand to be very small. The company will hereafter publish semi-annual earnings statements.

New Winther Company May Purchase Factory

KENOSHA, WIS., July 2—The property of the defunct Winther Motors, Inc., will be offered for sale at public auction by the receiver at the plant office on July 12, it is announced. Stockholders have received a definite plan of reorganization from a committee of seven, headed by Dr. E. W. Timm of Milwaukee.

This purposes the formation of a new company under the laws of Wisconsin, with a capital of \$500,000, consisting of 50,000 shares at \$10 each. Much favor has been merited by the plan and the committee will enter a bid at the sale to take over the property intact and resume building Winther trucks.

NEW YORK EXECUTIVES TO ORGANIZE A CLUB

NEW YORK, July 2—Executives in the automobile industry in New York City will organize a club along lines similar to the Transportation Club, which has its headquarters in the Biltmore. Plans for this were made at a dinner presided over by Alfred Reeves, general manager of the National Automobile Chamber of Commerce.

It will be a lunch club, where executives can gather and also entertain visitors from the factories. Until permanent headquarters can be secured, the new organization will hold forth at the New York Athletic Club, through the courtesy of Vice-President W. C. Poertner, who also is Durant distributor.

Chairman Timm told the stockholders, in presenting the committee report, that requests had been received from truck owners and dealers through the country offering support to a plan which would keep the Winther truck on the market, and that it is well known that the trade name and efficiency of the vehicle is a valuable asset, but quick action is necessary to gain a proper realization.

Ford to Turn Out Truck with Body This Summer

DETROIT, July 3—The Ford Motor Co. has outlined plans for the sale of its truck complete with cab and body, probably starting some time this summer. The cab and body will become part of the regular equipment to the truck. Prices will be set later.

It was the company's plan to begin building its own combination body on the truck last summer, but this was deferred. It is understood that the company's intention in so equipping the truck is to give the buyer a body at a price in conformity with the chassis price.

AMERICAN METAL RECEIVER

MILWAUKEE, July 2—Creditors of the bankrupt American Metal Parts Manufacturing Co. met June 25 and elected Julius J. Goetz of Milwaukee receiver. The next meeting will be held July 9. The concern manufactured automobile bumpers and other equipment. The voluntary petition filed June 12 claimed assets of \$97,631 and admitted liabilities of \$48,673.

CLIMBER RECEIVER NAMED

LITTLE ROCK, ARK., July 2—X. O. Pindall has been appointed receiver of the Climber Motor Corp. and an order issued closing the plant pending an adjustment of the company's affairs. This action followed the application for a receiver and a judgment of \$60,019 filed by W. H. Owens, trustee for bondholders.

Dallas E. Winslow Acquires Paterson

Capitalization to Be Increased, Present Line Changed and Prices Lowered

DETROIT, July 2—The W. A. Paterson Co., Flint, manufacturer of the Paterson car, has been purchased by Dallas E. Winslow, Dodge Brothers dealer in that city, who will reorganize the company on a basis permitting of considerably increased production. Winslow will be president of the company, and plant supervision will be vested in E. C. Kollmorgen, in charge of Paterson engineering and production for the last nine years. The new incorporation will increase the present \$300,000 capitalization materially.

Same Interests Continue

By the end of the month Winslow says he hopes to have details in such shape that the new incorporation may be filed and the full list of officers announced. Interests that have been identified with the Paterson company will also be identified with the new company, but it is planned to bring in new capital and undertake a general expansion of the business.

The Paterson line will be changed to a considerable extent, though maintaining the general principles of the former type. Prices will be lowered throughout, the largest reduction to be in closed models, Winslow says. The extent to which production will be increased is largely a matter of closed body supply. Retention of the name and product is planned, according to Winslow, because of its established character.

The Paterson company dates back to 1869, when it was formed by W. A. Paterson as a carriage building company. In 1909 the manufacture of automobiles was started. In 1921 W. A. Paterson died, and since then the business has been continued by his son, W. S. Paterson, and son-in-law, W. R. Hubbard, who were associated with him for many years. Winslow has been in the retail automobile business in Flint for six years.

With Industry Since Early Days

Kollmorgen has been identified with the industry since its early days. Before joining Paterson nine years ago, he was associated with the R. C. H. company in Detroit, and later joined the O. K. Truck Co., which subsequently reorganized as the Lincoln Motor Co., but not connected with the later Leland company of the same name.

Winslow plans to sell the new Paterson car through the present dealer organization of that company and will extend dealer representation as rapidly as factory production makes possible. Investigations in the retail field, he said, convinced him that there was a large market for the type of car he proposes to place on sale.

Kelly Tire Centers Work at Cumberland

**Closes Down Its Akron Plant for
Period of from Thirty to
Sixty Days**

AKRON, July 3—The Akron plant of the Kelly-Springfield Tire Company closed its doors here on Saturday, June 30, and will remain closed indefinitely, according to local officials.

The closing of the Akron plant materializes a rumor long standing and constantly denied, that the Kelly-Springfield Co. eventually would abandon its Akron manufacturing activities and concentrate its tire production in its Cumberland plant.

The shut-down here throws about 500 men out of work but most of these have been quickly absorbed by other Akron tire companies. According to Superintendent Louis Mueller, the Akron factory has been averaging about 1800 tires a day for several months. The notice given to the employees was that the factory, beginning July 1, would be closed for 30 or 60 days, but it is reported in tire circles here that the plant will be either sold or leased to other interests, and never again be operated by the Kelly-Springfield company.

Reports that the Goodyear Tire & Rubber Co. and the Seiberling Rubber Co. of Barberton were trying to secure the Kelly-Springfield plant are denied. Goodyear now is not utilizing all of its own factory floor space, while the New Castle, Pa., and Barberton plants of the Seiberling company, are able to meet the company's sales and no further Seiberling expansion seems probable at this time.

The new industries bureau of the Akron Chamber of Commerce announces that it has several prospects for the leasing of the Kelly-Springfield plant as soon as it becomes available.

Wenstone Will Operate Factory of Boone Tire

MILWAUKEE, July 2—The Wenstone Rubber Products Co. of Chicago has announced that it will resume the operation of the former Boone Tire & Rubber Co. plant at Chippewa Falls, Wis., acquired by purchase several months ago, on July 9. The first department will start production July 5 and others will go in work as material progresses.

The Chippewa plant will be devoted largely to the manufacture of tires and tubes, an activity which will be supervised by Thomas W. Carr, formerly superintendent of the Hannibal (Mo.) Tire & Rubber Co. J. L. Walton of Chicago will be general manager of this plant and has been on the ground two months to supervise retooling and other work necessary to put the plant in shape for production. The factory has been idle for about 18 months.

GLIDERS TO COMPETE AT BERKELEY, OCT. 15

BERKELEY, CAL., July 2—Motorless flying, with the aid of gliders, will be demonstrated on the hills of Berkeley this year, when the first International Gliders' Meeting and Contest will be held here, at a point directly opposite the Golden Gate, where the cold and strong sea breezes strike the Berkeley hills and give sufficient lifting power.

The meeting will open Oct. 15, and Henry C. Reynolds, a member of the Allied Flyers' Club is in charge of the arrangements. Money has been raised to defray the expenses of the meet, and foreign delegates have entered their gliders from Germany, France, England, Italy and Spain.

New Model of Davis Car Has Mechanical Changes

RICHMOND, IND., July 3—The George W. Davis Motor Car Co. is now marketing its 1924 models, which embody several mechanical changes over the 1923 models.

The engine is a Continental 7-U, 3 1/4 x 4 1/4 in., which replaces the 6-Y model previously used. The universal joints are of the fabric type, and the new design Timken axle is equipped with 14 in. drums for the service brakes, the emergency set being on the propeller shaft.

Cole Produces Sedan as One of New Series

INDIANAPOLIS, July 3—The royal sedan is one of the first Cole "Master" models to get into production. It has a seating capacity of seven passengers. The body is finished in old Lorraine blue with upper quarter panels, sheet metal parts and chassis in jet black. The upholstery is taupe mohair velvet, and the body trimmings are frosted silver.

ISAAC G. JOHNSON RETIRES

NEW YORK, July 3—Isaac G. Johnson & Co., established in 1850, has retired from business following the condemnation by the State of New York of the peninsula at Spuyten Duyvil, N. Y., on which its plant was located in order to widen the Harlem River channel. The company is known in the industry through its manufacture of light castings used in automobile construction.

RUBBER INVESTIGATORS SAIL

NEW YORK, July 3—Dr. Carl D. La Rue, Dr. James R. Weir, E. I. Prizer and M. K. Jessup of the Bureau of Plant Industry, Department of Agriculture, and Dr. C. F. Marbut of the Bureau of Soils, sailed today for South America to undertake a study for the Government of rubber plants in the Amazon Valley.

Good Position Shown by Mason in Report

**Current Assets Put at \$1,963,716
and Current Liabilities,
\$1,272,587**

AKRON, July 2—The annual balance sheet of the Mason Tire & Rubber Co. shows the company to be in an unusually strong position financially. The figures cover the fiscal year ending April 30, 1923, and indicate that the company is holding itself in a liquid cash position.

Current assets totaling \$1,963,716 include \$957,747 in cash in bank and \$1,005,969 in accounts receivable and trade acceptances. Current liabilities are given at \$1,272,587, including \$940,049 in notes payable, \$159,838 in accrued wages, interest, etc., and \$172,699 reserve for Federal income taxes.

Total inventories are valued at \$3,987,869. These include raw materials, \$468,514; work in process, \$264,617; finished product, \$1,199,512, and sundries, supplies, etc., \$91,508. Deferred charges to future operations are listed at \$332,934, and investments at \$218,216. Plant and equipment are listed at \$4,775,901 less a reserve of \$653,463 for depreciation, with good-will and organization expenses listed at \$1,243,056. Total assets are \$10,115,382.

Liabilities other than current include \$2,000,000 in first mortgage twenty-year 7 per cent gold sinking fund bonds, \$240,747 preferred dividend warrants without maturity date; \$94,597 miscellaneous reserves; \$6,128,990 in 7 per cent cumulative preferred stock issued and a surplus of \$377,960.

The company reports that sales for the first four months of 1923 exceeded \$3,500,000.

Tire Makers Wait Move by Firestone on Prices

AKRON, July 3—For the time being it appears that an armistice is in force in the tire price war in the Akron district.

Nearly all major companies have met the 10 per cent reductions made by the Firestone Tire & Rubber Co. and are waiting for Firestone to make the next move. Reports current for some time that Firestone either had or soon would reduce prices again to undercut competitive manufacturers, are meeting with instant official denial at Firestone's offices, and the word is given out that no additional price cuts are contemplated.

The reductions made practically annul the second advance made the forepart of the year.

FORD'S BODY PLANT BUSY

DETROIT, July 3—Ford Motor Co.'s body plant and sawmill at Iron Mountain has been put on a twenty-four-hour basis, 2000 men being employed.

Toledo Group Bids for Overland Stock

Offer Provides for First Preferred Stockholders—Court Defers Action

NEW YORK, July 3—Whether or not the 739,860 shares of Willys-Overland stock held by the Willys Corp., which is in the hands of a receiver, shall be sold is still unsettled, despite the legal skirmishes which have taken place recently in Toledo and New York City. After two court sessions here this week, the matter went over to July 23 at Buffalo, when the Federal Court will reply to the three bids which have been filed.

This decision was reached this afternoon by Judge Knox, who accepted a check for \$150,000 as a deposit on a bid of \$3,000,000 made by Thomas H. Tracy, representing Toledo interests in court here on Monday. This offer is the same in amount as made previously by the merchandise and bank creditors' committee, differing from the other in that it makes no provisions for the first preferred stockholders, whereas Tracy agrees that all profits from marketing the stock in excess of \$2 would accrue to the first preferred stockholders; that the remainder was to be paid on the delivery of stock certificates and that the present relationship of John N. Willys with the Willys-Overland Co. be continued for a term of years.

Distributors Make Bid

A third bid of \$5 per share on 300,000 shares was made by two prominent Overland distributors, George W. Brown of Milwaukee and Guy O. Simons of Detroit, which was to be considered only in the event that the Tracy bid was not accepted, and with the understanding that the remaining 439,866 shares be withheld from the market for six months. The court asked for a deposit of \$15,000 on this bid, which was given.

Because of the proviso that John N. Willys shall remain at the head of Overland affairs for a term of years, the Tracy bid is interpreted to mean that the Toledo interests really represent those who are fighting in behalf of the man who built up the Overland business, and the postponement of the decision as to the sale of the stock is generally accepted as another John N. Willys victory, although in the court proceedings now going on Willys is in a neutral position. The bid made by the Overland distributors is regarded as a line of secondary defense, to be used in case the Tracy bid is not accepted.

Long Delay for Control

While it has been said that the stock held by the Willys Corp. represents control of the Willys-Overland Co., yet such control could be gained only after a lengthy period, for before the common stock would have any say in the matter, the claims of the holders of the first

preferred stock would have to be satisfied, and that is something that is controlled by the Willys-Overland executives.

The battle for the stock has been accentuated by the fine showing which has been made this year by the Willys-Overland Co., whose earnings are reported to range from \$1,000,000 to \$1,500,000 at the present time. June was a banner month with the company, the production in the Toledo plant alone reaching the record-breaking total of 22,180, with 1100 established as a high water single day mark.

An interesting angle of the Willys Corp. situation was the report made to Judge Knox by Receiver Caffey, who stated that, outside the Willys-Overland stock, the only securities remaining with the receiver are a portion of 40,000 shares of Fisk Rubber common, 1000 shares of Connecticut Telephone & Electric common, 3600 shares of Knight-American Patents Co. and common and preferred shares of the Doehler Die Casting Co. In addition to these securities, the receiver has on hand approximately \$1,000,000 in cash.

C. H. Wills Remains Head Following Sale of Plant

(Continued from page 41)

Wills and his sales manager, E. C. Morse, were in conference on plans.

In the reorganization it is certain that the active management of the company will be concentrated in the hands of a small number of executives, and the influence of the financial forces will be found in the board of directors. The personnel of this will be announced when the new corporation is formally filed. In confining the executive offices in a few hands, there is a marked difference between the new company and the former company when first founded.

Business possibilities of the new company were outlined by Willys when he declared that sales in the first half of this year, during all of which the company was in the receiver's hands, were within a few cars of the total sale in the first half of last year. The distributor organization was for the most part intact, he said.

Gasoline Consumption Increased 18 Per Cent

WASHINGTON, July 3—Consumption of gasoline during May shows an increase of approximately 18 per cent over the gasoline consumption during May, 1922. Figures just compiled by the Department of Interior show that the May consumption this year was 582,554,181 gal., as compared with 499,542,343 gal. in May last year.

The figures show the nation's stock of gasoline on June 1 as 1,328,533,247 gal., compared with stock on hand on the same date in 1922 of 856,607,102 gal. Exports of gasoline in May were 71,678,000 gal. being 14,000,000 gal. more than the May, 1922, exports.

Equipment Business Runs Ahead of 1922

Optimistic Reports Made at A. E. A. Convention—Educational Work Needed

DIXVILLE NOTCH, N. H., June 30—Automotive equipment business in all branches—accessories, replacement parts and shop tools and machinery—is running 25 to 100 per cent ahead of last year, according to reports of manufacturers and jobbers from all parts of the United States and Canada, who met here this week at the spring convention of the Automotive Equipment Association.

Sales of shop equipment particularly have shown marked gain, with the maintenance trade becoming better acquainted with new methods of repairing and with competition forcing widespread adoption of flat rates.

There is still much educational work to be done, however, and shop equipment manufacturers and their jobbers are anxious to have the support of car and truck manufacturers in convincing dealers that service work, with proper equipment, can be made a profitable branch of the business. The equipment people also would like the vehicle makers to urge their dealers to purchase good tools and machinery.

800 Visitors at Convention

The convention brought together about 800 people, nearly half of them delegates and the other guests and families of members of the A. E. A. Convention sessions lasted three days, the climax of which was the presentation of a new film to promote the sale of automotive equipment for Christmas. The film, "An Automotive Christmas," will be shown at meetings of manufacturers' and jobbers' salesmen and dealers and garagemen and their employees throughout the country. The "Ask 'em to Buy" and "Shop Profits" films will be continued.

The annual convention of the association will be held in Chicago Nov. 12, coincident with the annual business exhibit, the A. E. A.'s wholesale trade show, at the Coliseum. The 1924 spring convention will be held the first week in April in New Orleans.

Buick Will Make 200,000 Cars in Its Fiscal Year

DETROIT, July 3—Buick Motor Co. sales in the fiscal year ending Aug. 1 will approximate 200,000 cars, 150,000 more than the early estimate. Compilation of sales for the first five months ending this year approximate 96,000, including American and Canadian plants.

The report on June sales is incomplete, but indicate 15,000, aggregating for the first six months 111,000. Production scheduled for July is 13,000, which is below normal due to stock-taking and re-equipping of plant.

Truck Competition Hearing Is Resumed

I. C. C. Commissioner Suggests Inquiry Into Share All Carriers Pay for Roads

WASHINGTON, June 30—Motor truck competition with railroads was again under fire before the Interstate Commerce Commission today when H. H. Chandler of the Boston Chamber of Commerce argued against an increase in express rates.

Commissioner Potter declared that "it would be a good thing while everybody is lambasting the railroads and asking us to help them lambast to have a little cooperation with the carriers to find out what is the matter, and particularly to find out about this motor truck competition, what it amounts to and whether there should not be a general inquiry about all forms of transportation to see if each is bearing its share of burdens."

Chandler expressed his agreement with Potter and pointed out that the motor truck should be required to make a contribution to the expense of maintaining the highways. He stated that probably the motor truck was not paying its proper share for the support of the highways used by it while the railroads were paying more than their share.

According to Chandler, it has been impossible to ascertain the exact volume of the competition in New England, because motor truck companies do not furnish figures showing the results of their operations. He has promised to obtain figures of a survey made in New Hampshire regarding motor truck operation and forward the data to Potter.

Railways in California Order Buses as Feeders

SACRAMENTO, CAL., July 3—The Pacific Electric Railway Co. of Los Angeles and the Los Angeles Railway Co. have ordered eighty motor buses, and will operate them as auxiliaries to their electric lines, according to announcement here by W. V. Hill, manager of the California Electric Railway Association, who is here in connection with the various measures proposed at the recent Legislature to tax and otherwise regulate motor bus lines.

Free use of the State highways, with exclusive franchise privileges, granted without cost and maintained under protection furnished free by the State has made the business of motor bus operation so attractive, according to Hill, that the corporations operating the city and interurban electric lines are going into it extensively. The buses will be operated under the name of the "Pacific Electric Land Co.," in order to escape the State tax that electric railway companies must pay in California. In making his announcement, Hill said:

There has developed in the territory served by the Pacific Electric Co. bus competition which is taking a gross annual operating income of approximately \$1,596,145. The buses earning this money pay only the personal property tax on their cars. We shall not, of course, compete with our own lines, but the buses will be operated as feeders. By using buses, instead of extending our electric system, I figure that we shall save, in two years, in State taxes alone, about \$250,000. We shall also save the franchise tax and the cost of constructing and maintaining new rights-of-way. It is not unlikely that, between some points, we shall abandon our electric service. A mile of track and paving costs us about \$100,000 and new cars cost us from \$18,000 to \$20,000 each.

James F. Bourquin Dies Following Operation

DETROIT, July 5—James F. Bourquin, vice-president in charge of production of the Continental Motors Corp., died this week at Harper Hospital following an operation for appendicitis. He was forty-five years old and had been prominent in the industry for many years, having served with both the Liberty Motor Car Co. and the Paige-Detroit Motor Car Co. as vice-president in charge of production at different periods of their development.

Mr. Bourquin was born in Romulus, Mich., and had lived in Detroit since his graduation from the engineering department of the University of Michigan in 1904. Surviving him are his widow, two daughters and a son.

Funeral services were held Tuesday from his residence at Grosse Pointe Farm, burial being at Ann Arbor. He was a member of the Detroit Athletic Club and Detroit Yacht Club.

Largest Motor for Steel Mills Designed for Ford

DETROIT, July 2—The General Electric Co. is designing for use at Ford's River Rouge plant the largest alternating current motor for steel mill use in this country. It will develop 8000 hp. and will be used to drive a large blooming mill.

The principal product of the River Rouge plant will be high grade alloy steel. The plant will be equipped with a merchant mill, for which General Electric is making a 4500 hp. motor-generator set, three 10,000 KV-A auto transformers and forty-four mill motors.

Chevrolet's June Sales Were More Than 45,000

DETROIT, July 2—Reports for May show that Chevrolet delivered 44,453 cars in that month as against 45,791 in April. June sales were slightly more than 45,000, and July's are expected to be between 45,000 and 47,000.

Packard Motor Car Co. reports that in the first six months of this year it produced approximately 12,000 cars, compared with 5800 for the corresponding period of 1922 and 9800 for the last half of 1922.

Balloon-Tired Wheel Shows Strong Demand

Wire Wheel Corporation Reports Growing Popularity for Its New Product

BUFFALO, July 2—The Wire Wheel Corp. of America reports a steadily increasing demand for its 20-in. wire wheels equipped with balloon tires designed especially for Fords and Chevrolets. The wheels have a 20-in. base and the tires are 28 x 4 on a 27 x 3 1/3 rim. The tire equipment is made by various manufacturers and thus far has given users entire satisfaction although they have not been in use long enough to provide definite data.

Experimental wheels with a 20-in. base to be fitted with balloon tires are being made by the Wire Wheel Corp. not only for several tire manufacturers who are trying them out on various makes of cars, but for numerous automobile companies which are giving them severe tests on their own products.

While it is admitted that balloon tires are scarcely beyond the experimental stage, their advocates contend that the advantages gained outweigh any possible disadvantages. What will happen when blowouts occur in these large section tires while cars are moving at relatively high speed remains something of a mystery but no serious accidents have been reported up to this time.

Another conceded weakness is difficult steering at low speeds or when cars are motionless, particularly in parking them, but it is believed this difficulty can be obviated by changing the gear and worm ratios. Steering gear manufacturers are expected to solve this problem.

It is claimed for the tires that they are not easily punctured, that they will wear longer and that the better cushioning they provide will ease strains on cars, especially in the bodies, in addition to making riding much more comfortable.

Cadillac Has Completed Flat Rate Time Schedule

DETROIT, July 3—It is officially announced by the Cadillac Motor Car Co. that it has adopted a flat rate time schedule covering repair operations on its eight-cylinder cars, and that the schedule now is ready to be placed in the hands of dealers and distributors.

This schedule, which is called the Uniform Contract Service System, will make it possible for every service station in the country to give owners a flat price for labor. The factory has made no effort to set specified prices for certain operations, but rather left price spaces blank for local organizations to fill in.

This makes it possible for individual dealers to set their prices for the different operations in proportion to their costs.

Mitchell Appraisers Preparing for Sale

Possible Buyers Expected to Show Interest on Completion of Report

RACINE, WIS., July 2—It is expected that the report of the appraisers of the Mitchell Motors Co. will be ready for filing on July 15, enabling the trustee, Herbert F. Johnson of Racine, to conduct the sale of the entire property on Aug. 15, the date tentatively fixed for the sale.

While nothing tangible in the way of offers for the plant has developed so far, it is believed that when the appraisers' report is ready for inspection, and an idea of a minimum amount that would be acceptable to the bankruptcy court can be gained, a number of large interests will manifest their interest.

The plant is considered one of the best equipped in this country for the manufacture of a medium-priced passenger car, while the purchase would include a modern, proved design in production about eighteen months, requiring no important retooling.

Creditors are meeting regularly under the chairmanship of the trustee and are seeking to determine the reasons for the failure. Inquiry is being made into the bankruptcy of the New York Mitchell Co., which owes the Racine factory \$500,000. The books of the New York company are expected to be available shortly, when creditors will try to ascertain what became of the large number of cars shipped to this distributor on which no returns were made. The New York company has no property which will be of any benefit to creditors, so there will be no division of assets.

H. & M. Body Corp. Reached Maximum Capacity July 1

RACINE, WIS., July 2—The H. & M. Body Corp. of Racine, Wis., which is now owned solely by the Hupp Motor Car Co., Detroit, through acquiring the interest of the Mitchell Motors Co., reached maximum capacity July 1.

Speaking of business conditions, Lamont A. McDowell, department head, says:

We have so many orders ahead that we do not plan any letup in our work before Dec. 1, 1924. We even intend to take our annual inventory at the end of the year while working full time.

At present we are far behind on orders, although this situation is due to some degree to the difficulty of securing sheet metals. We are assured of better deliveries, however, as the result of having three men on the road for the past month, doing nothing except pushing shipments through from mills to our plant. Our biggest work at present is enclosed bodies.

The closed car has come into great popularity and it looks as if body types have been pretty well standardized so that no important changes in designs requiring extensive

COUNTY SHUTS ROADS TO BUS OPERATIONS

MARTINEZ, CAL., July 2—The board of supervisors of this, Contra Costa, county has adopted an ordinance prohibiting motor buses from operating on the Antioch-Oakley-Sherman Island Highway, the main highway across this county.

The ordinance is similar to others already adopted by this board, forbidding bus companies to operate on other highways of the county. The intention of the supervisors is to prevent the operation of buses throughout the county, in pursuit of a policy, the supervisors announced, "of protecting for all time the highways of Contra Costa County."

changes in production methods are immediately ahead of us. We are now shipping twice as many bodies as at this time in 1922 and deliveries are increasing almost every day.

Fisher Will Increase Force at Janesville

JANESVILLE, WIS., July 2—An increase of 200 operatives, bringing the force to 325, will be made July 9 by the Janesville factory of the Fisher Body Corp., established several months ago to serve the Janesville branch of Chevrolet, occupying a big plant converted from the purposes of the Samson Tractor Co.

Up to this time the Fisher plant here has been engaged largely in putting finishing touches on bodies assembled at plants elsewhere and shipped to Janesville in the rough. The additional force means that the factory will begin to build bodies from raw and semi-finished materials. Production at the rate of 100 bodies daily is expected to be reached by the end of July.

Ford Acquires Virginia Site for Assembly Plant

NORFOLK, VA., July 2—Official announcement is made that the Ford Motor Co. has purchased for \$135,000 forty-four acres of land at Newton Park, with a frontage on the southern branch of the Elizabeth River. An assembly plant will be erected there to care for Southern business.

It is expected that the plant will be completed in eight months. It is planned to start operations with 1000 men, reaching 3000 in three years. It also is the Ford company's intention to erect deep water terminals for the shipment of cars to South America and Europe.

GENERAL MADE FLYING PILOT

WASHINGTON, June 30—Major General Mason M. Patrick, sixty years old, and chief of the Air Service, has qualified as a flying pilot of the army.

Business Sound, Say M. A. M. A. Directors

Declare That Industry Is Benefit- ing from Wide Demand for Transportation

NEW YORK, July 2—Checking up from first hand reports from leading executives and credit managers of the principal companies manufacturing parts, units and equipment, the board of directors of the Motor and Accessory Manufacturers Association, which held its regular meeting on Friday, declares that automotive conditions at the present time are sound and flourishing.

It states that the world is eager for more and better transportation, and that the automotive industry, meeting that demand and meeting it efficiently, is benefiting thereby. The board believes that business will continue to be good.

In a statement following the meeting, General Manager M. L. Heminway, outlined the situation as follows:

"The volume of passenger car manufacturing continues to be satisfactory, with sales equally so. Wide distribution of passenger cars has been accomplished this season. In terms of credit these sales appear to be sound.

Truck Business Increasing

"Truck manufacturers are increasing their production and sales. This branch of the automotive industry is coming back in a spirited manner.

"In the matter of orders, parts manufacturers are quite well satisfied and gratified at the lack of any seasonal reduction or slowing down.

"Bank support is remarkably good for the vehicle makers and the companies supplying them with material and parts. Collections are reported as being uniformly good. The general credit condition is excellent. There is no evidence of deferments, cancellations or suspensions of current manufacturing schedules. This shows that the car manufacturers and parts manufacturers have been wise in the matter of their commitments.

"Labor is well employed in all branches of the automotive industry and continues to show a higher rate of efficiency than at any time since 1920."

Body Maker Places Order for Carloads of Lumber

SAVANNAH, GA., July 2—The Southern Box & Lumber Co., manufacturer of ash and maple lumber used by the automobile trades and body trades of the North, is extensively improving and enlarging its plant at Port Wentworth.

A Western automobile concern placed an order in June for thirty carloads of lumber with this company to be used in the manufacture of bodies, one of the largest orders received this year from the automobile industry.

Men of the Industry and What They Are Doing

Stranahan Returns Home

R. A. Stranahan, president of the Champion Spark Plug Co., Toledo, is home from an eight-week European trip, during which he extended and strengthened the Champion distribution in England and the Continent. Stranahan reports a vigorously growing and good future prospects for American automobiles in Continental Europe and the British Isles, and states that there is an opportunity for much heavier sales in foreign countries of American replacement parts.

Baker Chief Engineer for Overland

Arthur J. Baker has been appointed chief engineer of the Willys-Overland Co., Toledo. He joined Overland in August, 1920, when he took charge of its factory research department. He came from the Cincinnati Milling Machine Co., and served with the ordnance department during the war.

Legge Has New Connection

W. D. Legge, since 1917 master mechanic and chief tool designer for the Four Wheel Drive Auto Co., Clintonville, Wis., has resigned to accept a position with the Tuttle Press Co., Appleton, Wis. Legge assumed his new duties July 1.

Breeden in Charge of Steel Office

William Breeden, formerly general manager of sales of the Lackawanna Steel Co., has been appointed manager of steel sales for the Buffalo district by Peter A. Frasse & Co. Breeden will be located at 52 Exchange Street, Buffalo.

Hutchinson O. K. Truck Official

Rollin W. Hutchinson, Jr., has been appointed vice-president and assistant general manager of the O. K. Truck Manufacturing Co., Okay, Okla., formerly the Oklahoma Auto & Manufacturing Co. For over eleven years Hutchinson has been associated directly and indirectly with motor trucks in sales, advertising and transportation engineering capacities, being identified with the International Motor, Sterling and Vim companies. The O. K. company, established in 1918, was recently reorganized with Dan L. Jones of Jonesboro, Ark., as president.

Feiker with Electrical Society

F. M. Feiker, formerly vice-president of the McGraw-Hill Co. of New York and more recently on leave of absence as special agent to the Department of Commerce at Washington, will be associated with the staff of the Society for Electrical Development, 522 Fifth Avenue, New York, serving as special counselor to all branches of the electrical industry. He will retain a consulting relation to the McGraw-Hill Co. and will

continue in a similar capacity his relation to the problems of personnel and organization of the Department of Commerce.

Cramer on City Commission

Robert Cramer, vice-president and chief engineer of the Cramer Manufacturing Co., manufacturing water and oil pumps and auxiliary automotive equipment, has been appointed member of the Sewerage Commission of Milwaukee, which is handling a \$15,000,000 municipal sewage system to be completed in 1926. The position carries no salary. For several years Cramer has served as secretary of the Milwaukee Engineering Society, a combination of the local chapters of the various national engineering associations.

Elected Lincoln Highway Directors

G. M. Stadelman, president of the Goodyear Tire & Rubber Co., and C. S. Mott, vice-president of the General Motors Corp., have been added to the board of directors of the Lincoln Highway Association. Both Goodyear and General Motors are interested in the project, the former having contributed \$100,000 and the latter a similar sum for the development of the ocean-to-ocean route. President J. N. Gunn and the other officials were reelected at the same meeting.

Walker Delegate to Congress

George W. Walker, president of the Trublruf Tire Co. of Atlanta, has been appointed vice-chairman to represent the Atlanta district with the Southern Commercial Congress on its industrial visit to Scandinavia in July. The purpose of the trip is to establish closer relationship between Southern manufacturers and Scandinavian countries.

George G. Everitt Promoted

George G. Everitt, for eleven years associated with the Whitman & Barnes Manufacturing Co.'s eastern sales organization at New York, has been made manager of the New York office and warehouse.

Rosser District Sales Manager

C. C. Rosser, for many years connected with the Detroit Seamless Steel Tubes Co., has been appointed district sales manager, with offices at 1206 Guardian Building, Cleveland.

NEW CADILLAC FOUNDRIES

DETROIT, July 3—Cadillac Motor Car Co. has completed plans for the erection of three foundry units to be added to the main factory. The new foundries will be for the production of gray iron, aluminum and brass castings.

Big Interest Abroad In Motor Transport

Coordination Is Occupying Attention of Governments, Pyke

Johnson Says

NEW YORK, July 2—The growth of motor transport in England and on the Continent is what most impressed Pyke Johnson of the National Automobile Chamber of Commerce, who has just returned from a trip abroad, which included attendance at the session of the International Road Congress at Seville. He found that questions of finance, coordination of motor with other forms of transport and handling traffic in congested areas are among the subjects uppermost in the minds of Government officials.

In telling of conditions, Johnson says:

In England, for example, Parliament recently has considered a bill in which the railroad companies asked for powers to operate motor vehicles on the highways, and, while the right was denied, the general feeling is that the subject has not yet been closed.

The problem of providing London with new outlets for the ever growing volume of traffic over the roads is being studied; while the question of taxation is under continued study with a view to bringing governmental budget needs into economic relationship with road transport.

Buses Supplement Railways

Steps in the direction of coordinated transport already have been taken with marked success in France, where railways are operating long distance motor bus lines as a supplementary operation. In Italy a movement is being made in the direction of government-aided highway construction whereby a transport company is given exclusive rights to a road on condition that it pays the government the cost of road construction and maintenance. In Spain there has been a marked acceleration in modern transport, with the result that the bullock cart already has been replaced in a great many cases by automobiles.

From a commercial standpoint England, Scandinavia, Holland and Spain appeared to Johnson to offer the best markets at the moment for the American car, high tariffs operating to its disadvantage in France and Italy particularly.

SAVING SPRING IN NEW PLANT

ASHLAND, MASS., July 3—Saving Spring Co. has taken possession of its new plant here where it will manufacture vehicle springs. The occasion was celebrated by a housewarming which was attended by manufacturers from whom the company buys its materials. E. F. Bunker, president of the Saving Spring Co., was the host at the dinner which marked the opening.

Race at Kansas City Won by Eddie Hearne

Drives Durant Special at 105.76
M.P.H.—Cooper in H. C. S.
Special Next

KANSAS CITY, MO., July 4—Circling the one and one-quarter mile speedway at an average speed of 105.76 m.p.h. for the entire 250 miles without making a single stop, Eddie Hearne of Los Angeles, driving a Durant Special, won the second national championship race held over the Kansas City speedway today. His official time for the distance was 2 hours, 21 min. and 21.15 sec.

Earl Cooper, in an H.C.S. Special, was second in 2:27:33. His average speed was 101.3 m.p.h. Harlan Fengler, in a Durant Special, driving his first race over a board track, was third, making the distance in 2:44:54.88. His average was 90.95 m.p.h. Dave Lewis, in a Duesenberg, was fourth, his time being 3:03:24. Frank Elliott, in an Elliott Special, was fifth. Only five cars finished while twelve started.

Hearne's time for distance was somewhat slower than the record for 250 miles, which is 115.60 m.p.h., established by James Murphy on the Los Angeles track. It is slower than the average time of 107.86 for 300 miles, made by Tommy Milton in winning the first race here last year.

Drivers Forced Out of Race

Milton, Murphy, Hartz, DePalma and Ora Haibe were all forced out of the race by burned up bearings or broken connecting rods. The race was a mere procession around the giant saucer. Outside of some jockeying for places early in the race by Milton, Murphy, DePalma and Hartz, who figured among the leaders in the first fifty miles, there was but one real thrill furnished the crowd of 60,000. This was when Harry Hartz's Durant Special threw a tire and turned around three times.

The race was the first official test on a board track for the one-man cars equipped with engines of 122 cu. in. piston displacement.

The victory of Hearne was something of an upset, as Milton in his H.C.S. Special, Murphy and Hartz in Durant Specials and DePalma in his Wade Special, a Kansas City car, were the favorites.

Brunswick Tire Formed as Subsidiary Company

CHICAGO, July 3—The Brunswick Tire Co., a newly organized subsidiary of the Brunswick-Balke-Collender Co., has been incorporated in New York State to manufacture Brunswick tires, according to a statement made by President B. E. Bensinger, who also announces that the manufacture of Brunswick tires in the Muskegon, Mich., factory will be dis-

continued and another plant secured.

It is said that this new plant will be located in Akron. The Muskegon tire plant has been turned over to the wood-working division of the Brunswick-Balke-Collender Co., which has been pressed for room.

At the same time, Bensinger replies to rumors that have been in circulation to the effect that Brunswick-Balke was about to discontinue the tire department. "We want to assure our dealers at this time that the Brunswick tire is to be continued, and all reports and rumors to the contrary are untrue," he says.

The tire business, it is understood, will be carried on by the newly organized Brunswick Tire Co.

PERSONAL NOTES

Carr Enters Private Business

C. R. Carr has resigned as general sales manager of the Ruggles Motor Truck Co. of Saginaw, Mich., to engage in private enterprises. Carr had been with Ruggles for more than three years, starting in the Canadian plant and later being transferred to Saginaw to handle sales. Prior to the Ruggles connection, he was identified with the sales department of the Republic Motor Truck Co.

Stayart Joins Ruggles

I. L. Stayart, formerly sales manager and assistant sales manager of the Cole Motor Car Co., has been appointed director of sales of the Ruggles Motor Truck Co. of Saginaw, Mich. Stayart long has been identified with the sales division of the industry.

Flynn with Goodrich Tire

Gregory Flynn, former vice-president of the E. A. Cassidy Co. of New York, at one time a leading jobbing concern, has become associated with the manufacturers' sales department of the B. F. Goodrich Co. of Akron, with headquarters in New York City.

Sterling-Knight Names Boyle

T. A. Boyle has been chosen assistant sales manager of the Sterling-Knight Co. of Warren, Ohio, which has just gone into production on the Sterling-Knight car. Boyle formerly was sales representative and assistant manager of the Willys-Knight division of the Willys-Overland Co.

E. W. Hiatt Resigns

E. W. Hiatt has resigned as assistant general superintendent of the Racine Manufacturing Co. It is probable that he will locate in Detroit.

FISHER BODY OHIO ELECTION

CLEVELAND, July 2—All directors of the Fisher Body Ohio Co. were re-elected at the annual meeting, while at the directors' meeting which followed all of the old officers were reelected.

Wisconsin Governor Vetoes Gasoline Tax

In Message, He Declares It Is
Sales Levy and Discriminates
Between Users

MILWAUKEE, July 3—The net result of six months of wrangling in the biennial session of the Wisconsin Legislature, concerning changes in automotive license and taxation laws, is the adoption of a new system of annual licenses based on weight, instead of the present flat fee of \$10 a year for privately owned passenger cars, and the vetoing of a 2 cent per gallon tax on gasoline by the Governor after the two houses of the Legislature adopted the system by large majorities.

It had been deemed so certain that the Governor would approve of both the weight tax and the gasoline tax that State machinery had been set in motion to administer the gasoline tax act, which would have been effective July 1, this year.

Motorists of Wisconsin were resigned to their fate in respect to both weight fee and gas tax, although much opposition was heard against the fuel tax on the grounds that it was in practice a sales tax. The fact that thirty-five other States have enacted a gasoline tax was generally considered as making certain a similar enactment in Wisconsin.

The veto message of Governor Blaine said in part:

Difficulties in Collection

"It is not a privilege tax for the privilege of selling gasoline. It is a sales tax—a tax on property. It is contended that gasoline measures the use of the highways. That is true, and it is also true that the less improved highway requires more power in propelling an automobile, and therefore requires more gas.

"The difficulties involved in the collection of this tax are many. The tax is capable of evasion. It will involve the same experience as the Federal Government had with the tax on ice cream and ice cream cones. It creates discrimination between users for the reason that those accessible to the use of gasoline transported from without the State will escape."

The weight tax is estimated to raise \$6,500,000 annually for highways, while the gasoline tax was counted on to produce \$3,000,000 more. The Governor said the combined revenue was more than the people of Wisconsin could reasonably be expected to pay.

Virginia Losing Trade

WASHINGTON, July 5—The Virginia State gasoline tax of 3 cents a gallon, effective July 1, has resulted in an influx of State motorists to the Capital for their gasoline. Nearby garages and dealers in the State report that their gasoline sales have fallen off in some instances as much as 75 per cent.

A gasoline tax of 2 cents a gallon becomes effective in the District the first of January.

Syndicate Planning English Motorways

Pedestrians, Cyclists and Horse-drawn Vehicles Would Be Barred from Them

LONDON, June 24 (by mail)—Lord Montagu of Beaulieu, whose name has been intimately associated with British motoring since the earliest days, is chairman of a syndicate which has been formed to construct, with subscribed capital, two motorways running diagonally across England.

The first of these will run from London to Birmingham, Manchester and Liverpool, will be 226 miles in length and will cost £15,000,000, according to estimates. The other will run from South Wales to Newcastle. Both will be confined strictly to automobile traffic; pedestrians, cyclists and horse-drawn vehicles are to be barred.

The sanction of Parliament is an essential preliminary, and if this is secured, it is planned to commence the London-Liverpool road in October, 1924. The work will be placed in the hands of a score of contractors to work on different sections simultaneously, and by this means, it is suggested, the first motorway should be in use within five years after the commencement of work.

Roads 50 Ft. Wide

The roads will be 50 ft. wide, with space at each side for widening them later, if necessary, and will be divided into four tracks, the two outer ones for slow traffic and the middle ones for fast vehicles. There will be no gradient steeper than 2.5 per cent, and no curve will have less than a half-mile radius. There will be no crossing and all existing public roads, railways, canals and rivers will be bridged over or tunneled under.

The proposed routes do not run actually through any towns or cities, but will have junctions with existing roads leading into large towns.

Revenue will be secured by a toll payable in respect of vehicle using the motor ways at the rate of a halfpenny per ton-mile. According to estimates, the saving in running costs will be a penny per ton-mile, and if that be so, the vehicle owner will reap half that advantage. This economy would be due, it is said, to a number of factors; for example, there would be no limit of speed or weight, and this would double the earning capacity of trucks, while the smooth surface would reduce fuel consumption and maintenance costs.

Traffic Needs Roads

The main consideration which has actuated the syndicate in bringing forward the plan is the need for roads especially built for high speed and heavy motor traffic. "Our roads are admittedly inadequate today and will be even more inadequate in future for mechan-

ical transport," says Lord Montagu. "Our older highways have grown up, not on a well-thought-out system, but as a result of Roman military roads, haphazard farm lanes, and wandering cattle tracks."

It is argued that no amount of reconstruction, unless untold millions were spent, could possibly make these roads suitable for the ever-increasing burden of motor traffic.

The running costs, it is computed, would be reduced as follows:

Tires, oil and grease by 50 per cent.

Fuel by about 25 per cent.

Repairs and maintenance by about 50 per cent.

Many Makers Beginning Inventory Taking Period

(Continued from page 40)

will not be realized until the farmer is able to gage definitely the extent of the harvest and the prices it commands.

Commercial centers are increasing their truck purchases, and schedules among builders continue to be well sustained. No slowing up in this branch of the industry is expected owing to the conservative movement forward and the steadily growing demand for its products.

Conditions among parts makers are excellent, as indicated by the report of the Motor and Accessory Manufacturers, which shows that notes outstanding at the end of May had decreased 38 per cent during the month, and that accounts past due had fallen off 14.28 per cent. Sales in May aggregated \$58,409,550, as against \$43,700,000 in May of last year. This report reflects the general condition of motor vehicle manufacturers.

Manufacturers Prepare Plants for New Models

(Continued from page 40)

that, with the start afforded in the first six months, they will be easily in a position to round out their yearly schedules in the remaining months.

Buick's schedule of 180,000 for the fiscal year ending this month has been greatly exceeded.

Approximate schedules for the month in the light car field show Ford will operate at 6800 daily; Chevrolet, 1800; Star, 300, and Gray, 125.

Among the leaders in the medium priced field not affected by model changes, approximate schedules show Hudson in excess of 400 daily, Paige-Jewett, 200; Maxwell-Chalmers, 200, and Rickenbacker, 50.

In the high-priced field Cadillac's schedule in excess of 100 a day will be resumed following inventory now in progress. Packard is building about 100 daily, and Lincoln production is now about thirty-five daily.

Motorcycle Racers Average 55 M. P. H.

All Previous Records Broken in Three-Day Event Held on Isle of Man

LONDON, June 25 (by mail)—The annual series of motorcycle road races in the Isle of Man were run on three days this year and included events for Lightweights (maximum 250 c.c.), Juniors (maximum 350 c.c.), Seniors (maximum 500 c.c.), and Sidecars (maximum 600 c.c.).

The sidecar race was an innovation. All previous records for the course were beaten by the Lightweights and Juniors but the Senior race was run in rain and mist which resulted in a lower average than last year. For the first time for many years, in a series that commenced in 1907, a fatal smash occurred, one rider hitting a bridge and being killed.

Six circuits of a 37.7-mile course with innumerable corners, "hairpins" and narrow bridges, and running partly through a mountainous district, were set for the solo races and three circuits for the sidecars.

Average of Winning Cars

The winner of the Lightweight class averaged 51.9 m.p.h.; the first sidecar to finish averaged 53 m.p.h.; Junior, 55.7, and Senior, 55.5 m.p.h. There were 177 entries in all, comprising 14 sidecars, 40 Lightweights, 72 Juniors and 51 Seniors, representing 34 makes, of which only one was American (Indian) and even this one was compelled to run with a special single-cylinder engine to get within the cubic capacity limitation of the Senior class.

Ridden by Dixon, the Indian finished third—2½ minutes behind the winner. The latter rode a horizontal twin-cylinder Douglas, which had eleven representatives, the only machines with other than single-cylinder engines. The average of the Indian was exactly 55 m.p.h.

Far more than is the case with cars, these motorcycle races are of importance to the British industry. They are taken very seriously by the majority of makers, for a win or a place in any of the classes usually means an influx of extra orders in the following year, especially for "sporting" models, which form quite a considerable proportion of the output of many firms and which usually embody some of the special features of the racing machines.

Minimum Weight Set

To accord with the designation, "Tourist Trophy Races," all competing machines were obliged to have mudguards of specified dimensions, rear stand, two brakes and not be under certain minimum weights (132½, 165½ and 187½ lb. respectively for the solos and 275½ lb. for sidecars).

BUSINESS AWAITS BUYING BY FARMER

Denver

DENVER, July 3—Although some leading makes of cars have shown a slowing down of retail sales during June—which dealers believe to be due partly to people's waiting for their mid-year interest on bank savings—others are showing a gain over May, while the average is well ahead of a year ago, with some dealers reporting as high as double their sales volume for last June. In some cases, each month thus far this year has exceeded the corresponding month of 1922, and a few dealers have reached their peak month in 1923.

Not many dealers are willing to venture a prediction for the next three weeks, but those few willing ones are generally optimistic, in view of being now oversold or at least keeping even with factory shipments and other considerations.

The number of farms being operated in Colorado is slightly above normal, but far below last year. There is a good crop outlook for acreage under cultivation, however, especially in spring wheat, sugar beets, cane and alfalfa. Irrigated districts are in far better shape than dry farming sections. While business is rather slow among farmers right now, a substantial revival is predicted for the fall.

Chicago

CHICAGO, July 3—A period of considerable uncertainty is ahead of the automotive trade in this vicinity for the next month or two. It is generally conceded that fewer cars will be sold than were sold in the earlier months of the year, but the probable extent of the deficit is a conjecture with no very definite basis upon which to calculate.

The last week has witnessed a spurt in demand for both new and used cars, apparently due to a desire to possess a car for the Fourth of July holiday. A lull is certain to follow the holiday, and present indications are that only first class salesmanship can overcome it. Through it all, however, the demand for the lowest priced cars seems unabated. Dealers' salesrooms are bare, and purchasers must wait for delivery.

Crop conditions in this territory are favorable. The outlook for corn is good. The season is somewhat late, but fields have made rapid progress since the turn to warmer temperature.

Philadelphia

PHILADELPHIA, July 3—Open passenger cars continue to sell well, although there is a slight falling off since the middle of June. Sport models are in particularly good demand in grade of cars ranging around the \$1,000 mark and a little above.

The market is fairly well cleaned out

of closed cars at this time and some dealers say it will be a matter of weeks before they can get deliveries. Used cars are sluggish and the dealers are resorting to heavy advertising to move them. Dealers are awaiting the announcement of new models which are expected soon.

A few light commercial cars continue to be sold and a very few of the heavier dump-body types for the building supply trade, for road contractors and the like. Beyond that not much is doing in trucks.

Farmers are purchasing sparingly, this being ascribed to their having diminished their incomes by cutting down their plantings and leaving some of their fields idle for pasturage, because of the serious scarcity of farm labor.

Some county agents assert that rural labor is even scarcer in this district than during the war. The spurt of nine days' excessively hot weather has improved the crop outlook.

Seattle

SEATTLE, WASH., July 3—Retailers, especially of the standard makes of cars, report a continued strong demand. Reasons for good sales are: (1) Strong demand for lumber, both domestic and foreign, which keeps this key industry at capacity; (2) best crops and prices for small fruits received in last three years; (3) good prospects for wheat, grain and apple crops in the back country, with the assurance that the rolling stock shortage of last two years will not be so acute.

Dealers report the country salesmen find that the farmers have liquidated some of the heavy indebtedness they have borne in recent years and with the prospect of good crops and better prices they are less light in their purchasing. The demand for tractors, while not as heavy as hoped, is stronger than last year.

Minneapolis

MINNEAPOLIS, July 3—In low priced cars the market is good in the Minneapolis trade territory, and in high priced cars the business is confined chiefly to larger cities. Open cars still find ready sale, and several firms are having success with used car drives. Where districts have had good rains, the first time in two or three years there is noticeable demand for automobiles.

The greatest gain in the buyer column is from labor. The best record for the month is from merchants. With crops panning out as they look now and good prices, a long period of car sales is as good as made.

In general crop conditions are favorable, all grains showing good color and stand, with freedom from excess weeds and with normal moisture.

Detroit

DETROIT, July 3—Detroit dealers express a great deal of confidence over the prospects for retail business during the summer months. It is not expected that buying will be as heavy as in the early months of the year but a good summer business is looked for, better than usual in the July-August period. As a reason for this they point to the lack of unemployment in the city, and the generally prosperous condition of business.

Outside the city conditions are good in the manufacturing cities and towns of the State, but there is not much business in the rural communities. Dealers relying upon farm buying are not making many sales and are not looking for improvement before the fall months.

As the summer months approach there is declared an easing in the delivery situation, although in most closed models it is still a matter of a month's time at least. In most lines, open models can be delivered at once, not longer than a week in any line. Dealers are not stocking new cars in any class. The market for used cars has slowed down considerably with the result that dealers are more cautious in trades.

Truck business is reported exceptionally good, especially in lighter delivery models, but there is also good business in the heavier models.

Dallas

DALLAS, TEX., July 3—The sale of new cars by dealers in Dallas has been around 1150 a month and dealers state that there is no indication that business will be less in July. Fort Worth, Waco, Houston and San Antonio report sales holding up remarkably well.

A \$35,000,000 grain crop is being marketed. The fruit, tomato, potato and melon crops which will aggregate \$15,000,000 are reaching the markets in volumes. Automobile dealers declare this will mean better business in the smaller towns and the rural districts. The farmers are in fair shape, except in the cotton belts, and are buying automobiles and trucks.

Cleveland

CLEVELAND, July 3—There was a slackening of sales of automobiles in the Cleveland territory during June as compared with May. The drop in sales was not a radical one, and it was not sufficient to cause alarm for the immediate future.

Used car sales during June were heavier than in May due to the holding of a show here.

Purchases by people in country districts kept at a good rate, although it is doubtful if farmers bought as many cars in June as they did in May. They have not yet realized on their 1923 crops and produce.

SOME CITIES REPORT PEAK REACHED

San Francisco

SAN FRANCISCO, July 3—The peak of the retail automobile sales seems to have been passed here, with the passing of May, for all of northern California. June shows a drop of about 35 per cent in the wholesale business under that of May, but city business on popular lines is about equal to that of the preceding month. The dealers interpret this to mean that the farmers are not buying cars, that is to say, the agricultural population is not building up the trade as it did in April and May.

The crop production outlook is splendid, but prices and sales are not so good as to warrant the farmers in putting much money into passenger cars. More of them are having their old cars reconditioned. Cars selling below \$1,000 are going well, and those selling below \$750 apparently are maintaining the May average. Retail sales of high-priced cars are very slow, and the used car situation is getting worse, rather than better.

Indianapolis

INDIANAPOLIS, July 3—Car sales in June will run about as they did for May for Indianapolis, while the State may be off a trifle, with farmers too busy to buy cars, and with hogs still at a low point to slow up purchases on the part of those depending upon hog raising.

There are still shortages of cars in several lines, consequently in such cases the sales gains will not be reflected in June figures of registrations of new cars.

The outlook for local and State sales for the next three weeks is good, with uncertainty, however, about returns from rural sections. Wheat harvest is now starting and if the crop is satisfactorily harvested it will stimulate sales. Dairy farmers are in good condition.

Milwaukee

MILWAUKEE, July 3—Whatever slowing down in sales of passenger cars is now occurring is regarded by dealers as an expected seasonal development, based on the trend of business during 1922, whereas this year the peak of demand came about the end of May, although slackening was not appreciably felt until after July 1.

The reduction in Hudson and Essex prices, and current rumors that Ford is preparing to make another cut, probably on Aug. 1, have had an adverse effect on general selling, although dealers as a rule find prospects fairly well satisfied that prices already are low, and if further reductions are to be made, the amount will not be such that expectation of a saving will hinder immediate purchase.

Interior dealers have experienced an active farm demand all the year so far and report this well sustained. Wis-

consin is a dairy state, and rural families are not dependent for income upon grain crops, which are now selling at very low prices, while milk, butter and cheese are bringing fairly high prices. Therefore, the purchasing power is relatively good.

While sales to farmers have been in greater volume than expected earlier, selling work has been difficult, owing to the pessimistic attitude of farmers when solicited to buy almost anything. This, however, is a thing peculiar to farmers as a class.

St. Louis

ST. LOUIS, July 3—The crop outlook in this section of the country is fairly good, but there has been some dissatisfaction expressed by the farmers with the prospects of the prices they will receive for their produce. At present the buying season for the farmer has passed, and he is busy gathering in his harvest and otherwise employed, so that he may be considered practically out of the market. However, it is anticipated that the demand from the agricultural sections will be resumed within a short time.

Retail sales of automobiles in the city remain satisfactory, and the demand during the last two weeks has been particularly good.

Los Angeles

LOS ANGELES, July 3—It is not probable that automotive sales during July will continue the remarkable record that has been established in California the first six months of the year. The final week of June showed considerable falling off in demand, according to passenger car dealers, but motor truck business is picking up. This undoubtedly is due to the fact that many prospective purchasers hesitated until they learned the fate of the new motor vehicle bill at the recent session of the Legislature.

Farmers are buying almost exclusively low priced cars, and these not in particularly large quantities. There is practically no demand for cars retailing above \$2,000 outside of Los Angeles County.

Louisville

LOUISVILLE, KY., July 3—Sales of new automobiles in Jefferson County for the month of June amounted to 818 as compared with 1177 in May. Dealers expect the July sales to equal those of June. A number of the dealers are still having trouble getting certain models.

There is no doubt about the prosperity of farmers in this section. The crop outlook is good and farmers are buying more tractors and cars this year than during the same period of last year, although the volume of business to this class is not considered as great by Louisville dealers as it should be.

Toledo

TOLEDO, July 3—Retail sales of cars here for the last few weeks have been better than expected, probably due to many pre-holiday sales. The outlook for the next three weeks appears very good, sales being made to buyers going away on vacation.

Farmers are in the market in a small way but they are counted on to furnish much more business along in September. The crop outlook in this section is good and prices are better than for some years. Small towns in the Toledo territory are doing a good business for this time of year. Farm sales are not up to the point anticipated.

The used car market is improving from week to week.

There is still shortage in some lines of new closed models.

Pittsburgh

PITTSBURGH, July 3—A material increase in the sale of new cars is not expected within the next month. The ebb tide of new sales is on, but none of the dealers are discouraged. The best list of prospective purchasers contains those who wish to purchase standard makes and entered the market too late for even late spring delivery.

It is still impossible to get delivery on cars of these standard makes. Slowness in deliveries is forming a source of worry to dealers who fear cancellations with new models soon to appear.

There is no evidence of a loose supply of cars.

Trades are unwelcome to dealers who are fully stocked on used cars. The used car market is very slow. There are few farmers in this locality, but the local fruit crop and vegetable gardening will bring fair incomes. Purchases by these farmers are not too liberal, a conservative note being evident in buying.

Cincinnati

CINCINNATI, July 3—Retail automobile dealers in this vicinity, who were greatly perplexed (and many of them somewhat discouraged) as to sales prospects for the coming month, were greatly relieved by the recent heavy rains which broke a long hot spell. They believe that with this needed stimulant to the crops farmers will buy automobiles and other merchandise in increasing quantities.

Automobile sales in the Cincinnati district during the last few months do not seem to have met expectations, particularly sales of cars of the better grade. Low and medium priced cars have been moving better, orders for several of the most popular makes being far in excess of factory deliveries.

The volume of used car sales increased slightly during the past month.

Would Have British Dealers Pass Test

Proposed Institute of Motor Trades Would Keep Mem- bership Standard High

LONDON, June 24 (by mail)—A plan has been put forward in England to form an Institute of Motor Traders. The objects differ from any existing trade association, the main idea being to improve the status and qualifications of members of the retail automobile industry. The objects as set forth in the memorandum announcing the formation of the institute are as follows:

- (1) To provide an organization for motor traders in order to secure for them a definite status by means of a system of examinations, and the issue of certificates of competency.
- (2) To hold monthly meetings to hear a lecture or paper with discussion to follow.
- (3) To form a trade technical reference library, with suitable accommodation for consulting same.
- (4) To consider and recommend to the ruling trade organizations the views of the members (obtained by referendum) on matters of trade policy.
- (5) To provide a panel of arbitrators from the council to arbitrate on request in trade disputes.
- (6) To undertake investigation work on policies affecting the collective interests of members.
- (7) To publish a general monthly circular giving the synopsis of the previous month's work and activities of the Institute.
- (8) To carry on a service bureau for the use of its members.
- (9) To assist its members in obtaining desirable positions.
- (10) As may be determined by the council and confirmed by a general meeting of members.

The membership is to consist of Fellows, Members and Graduates and the qualifications in regard to each class are:

GRADE 1. FELLOWS. Candidates for admission as Fellows must be persons not under 26 years of age who have been three years in the trade as principal or manager.

Candidates will be elected by the council of the Institute primarily on account of eminence in and knowledge of the trade. They must either have served on the council or on a standing committee of a motor trade association for at least a year, or be at present principal or manager of a recognized motor business, or have been for six years a member of the Institute.

GRADE 2. MEMBERS. Candidates for admission as Members must be persons not under 21 years of age engaged in executive positions in the motor trade with at least three years' service therein, and to qualify as Members must be prepared to sit for and pass the prescribed examinations as determined.

GRADE 3. GRADUATES. Candidates for admission as Graduates must be persons not under 18 years of age engaged in the motor trade, and must be prepared to produce evidence of educational efficiency

to the satisfaction of the Council, or sit for and pass a prescribed examination. All candidates must be proposed and seconded by two members and supported by two recognized trade references.

During the first year of the establishment of the Institute the conditions imposed in the preceding paragraph may be waived and the council may at their discretion dispense with the examination test for membership.

Examinations will be held each year at the discretion of the council, in London and provincial centers, as may be arranged. The following subjects will be obligatory:

- (1) Motor trade law.
- (2) General commercial practice.
- (3) Elements of advertising and salesmanship.
- (4) Orthodox motor trade practice.
- (5) As may be prescribed by the Council.

The general scope of the examinations will be considered and set out by the council, who will appoint examiners to set papers and examine candidates.

FINANCIAL NOTES

Lee Rubber & Tire Corp., reporting for the three months ended March 31, states that net sales totaled \$1,715,317. Net profits after all charges and Federal taxes were \$127,554, equivalent to 85 cents a share on the 150,000 shares of no par value capital stock outstanding. In the four months ended April 30 the company manufactured 163,792 tires and 181,176 tubes and it estimates that the output for the current year will be 491,000 casings and 543,000 tubes. In 1922 it made 449,429 tires.

Universal Motor Co., Oshkosh, Wis., has amended its corporate articles to provide for an increase in authorized capitalization from \$100,000 to \$200,000. It manufactures 4-cylinder gas engines for cars, trucks, tractors, isolated electric lighting plants and stationary types. It is understood that the new issue will be employed to enlarge the production to meet increased demands. John D. Termaat is president and chief engineer.

Firestone Tire & Rubber Co. has declared the regular quarterly dividends of 1½ per cent on the 6 per cent preferred stock, payable July 15 to stock of record July 2, and of 1½ per cent on the 7 per cent preferred, payable Aug. 15 to stock of record Aug. 1.

Federal Motor Truck Co. has declared a quarterly dividend of 3 per cent, payable July 10 to stock of record July 3. The company formerly paid 2 per cent quarterly.

Rolls-Royce of America, Inc., announces a net profit of \$141,190 for the three months ended March 31, as compared with a deficit of \$157,914 for the first quarter in 1922.

CHALMERS' PHAETON HIGHER

DETROIT, July 3—The Chalmers Motor Co. has advanced the price of the regular five-passenger phaeton from \$1,185 to \$1,235. This change becomes effective immediately.

KELLY GUARANTEES PRICES

NEW YORK, July 5—The Kelly-Springfield Tire Co. has guaranteed tire prices to dealers against further reduction until Oct. 10.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

Trade and crop reports last week revealed generally more favorable conditions. Retail and jobbing trade is holding up well. But production in some lines continues to sag somewhat. The slower pace in steel production is attributed mainly to the weather.

The Government forecast of a cotton crop totaling 11,412,000 bales, based on the condition as of June 25, exceeds private estimates. Although the condition reported, 69.9 per cent of normal, is well below the ten-year average of 76 per cent for this date, the acreage under cultivation is the largest in the country's history, exceeding that of a year ago by 12.6 per cent.

The recession of average wholesale prices continues. The Fisher weekly index declined 1.9 per cent to a level slightly below the January average, and 7.7 per cent below the peak reached in the first week of April. Dun's index recorded a decline of 1.4 per cent during June. Meanwhile the anomalous condition of advancing wages, while prices recede, continues.

Car loadings in the week ended June 16 numbered 1,007,253, a decline of about 6000 cars from the preceding week. With allowance for a holiday interruption of traffic, loadings have regularly exceeded a weekly total of 1,000,000 cars since the middle of May.

Discounts by the Federal Reserve banks increased \$43,862,000 in the week ended June 27, while deposits increased \$15,285,000. The latter gain was entirely in Government deposits, member banks' reserve balances showing a decline of \$6,570,000. Federal Reserve Note circulation increased \$4,602,000, and gold reserves declined \$18,271,000, the reserve ratio declining from 77.6 to 76.9 per cent.

Loans by reporting member banks declined \$32,792,000 in the week ended June 20, while investments increased \$41,901,000. Bills payable and rediscounts with Federal Reserve banks increased \$20,645,000.

Three Studebaker Models Quoted at Higher Price

SOUTH BEND, IND., July 3—An increase of \$75 in the list price of the "Special Six" phaeton and roadster and \$20 in that of the "Light Six" phaeton has been announced by the Studebaker Corp. of America, effective July 1. The old and new prices follow:

	Old Price	New Price
"Special Six"		
2-pass. phaeton.....	\$1,250	\$1,325
5-pass. phaeton.....	1,275	1,350
5-pass. coupe.....	1,975	1,975
5-pass. sedan.....	2,050	2,050
"Light Six"		
2-pass. phaeton.....	975	975
5-pass. phaeton.....	975	995
3-pass. coupe.....	1,225	1,225
5-pass. sedan.....	1,550	1,550

California Set Mark by Its Sales in May

Vehicles Sold Reached Total of
25,046, Exceeding Best
Previous Month

SAN FRANCISCO, July 3—California distributors of automobiles and motor trucks broke all sales records during May, 1923, according to statistics compiled by *Motor Registration News*, published in Oakland, which shows that 25,046 automotive vehicles were sold in the State during the fifth month of the year.

The former high mark was 23,898, set in March, this year, and the May figures are still further above those of April, when 22,215 automotive vehicles were sold. The May, 1923, figures show an increase of 56 per cent over those of May, a year ago, and more than 50 per cent above those of May, 1921.

According to these figures, sixteen different makes of automobiles did the biggest business in May, 1923, that they ever have done in any one month in the State, while every one of the larger counties of California did a larger business in automotive vehicles than ever before. Percentage gains by some of the counties run as high as 80, and only one among the first 20 counties is charged with a decrease in business.

Motor trucks accounted for 2452 of the 25,046 sales, or nearly 10 per cent, and the increase in this branch of the industry for the State is 26 per cent. Truck sales in California for May, 1922, were 1378, showing a gain of 647 sales. While comparative figures are not available to substantiate his statement, F. W. Crinnion, publisher of *Motor Registration News*, says he believes that May sales of automotive vehicles in California are the largest ever recorded in any one State for any one month.

Vane Seeks Lower Rates on Freight to Pacific

ST. LOUIS, July 2—Before returning home, C. A. Vane, general manager of the National Automobile Dealers Association, who has been attending dealer meetings on the Pacific Coast, will conduct a series of conferences with traffic men of various industries, automobile dealers and association officials along the coast.

The purpose of the conference is to adopt a plan to present to the railroads in an effort to secure an adjustment of freight rates, which are reported as very high in that part of the country. The conference will be held in Los Angeles and San Francisco this month.

NASH SIX MONTHS' OUTPUT

KENOSHA, WIS., July 3—Shipping more cars per working day in June than in May, Nash Motors Co. finished the

first six months of 1923 with a total of 32,243 passenger automobiles. This is 11,783 more cars than were shipped during the same period last year. Nash Motors shipped 6135 passenger cars in June, as against 6208 in May, the record month in Nash history. The shipments for June exceeded those of June, 1922, by 1334 cars, and they exceeded April of this year by 519 cars.

INDUSTRIAL NOTES

Chanslor & Lyon Co., a large automotive jobbing concern on the Pacific Coast, has established a factory at Oakland, Cal., to manufacture tires which it will market under the name of C & L. These tires are especially designed for western use and are not to be offered for sale east of the Rocky Mountains. Headquarters of the company, which has eight branches, are at San Francisco.

Indianapolis Pump & Tube Co., of Indianapolis, manufacturer of the De Luxe line of accessories, has contracted for the erection of a modern factory building at Greenwood, Ind., ten miles south of the present plant site. The new quarters will provide a working space 100x300 feet, enclosed by a structure of steel, brick and wood. Production will start before Fall.

George H. Rives Manufacturing Co. of Brooklyn has been purchased by P. Q. Wray of Chicago, who has moved the offices and warehouse to 1464 South Michigan avenue, Chicago. The company manufactures a complete line of standard equipment and replacement pedal pads for all makes of cars.

Dalton & Balch, Inc., manufacturer of Silent timing gears, has started manufacture of its gears in its Toronto factory for the Canadian trade. The Chicago factory has been operating on a 24-hour schedule all this year, the company states.

WESTCOTT SALES CONFERENCE

SPRINGFIELD, OHIO, July 2—Westcott distributors and sales representatives from all parts of the country assembled here today at the plant of the Westcott Motor Car Co. for a general conference. Sales plans for the future and production schedules for the fall and winter were discussed with General Sales Manager E. H. Gilcrest and other officials.

BETTER CONDITIONS IN WEST

DETROIT, July 3—After a three weeks' trip through the Northwest and along the Pacific Coast, V. H. Day, general sales manager, predicts better business in all lines in that section. Increased truck sales, he says, forecast a demand for goods in all lines.

OLDS SALES ON INCREASE

DETROIT, June 30—Sales of Oldsmobiles in the first fifteen days of June were 43 per cent greater than during the same period of May. In the year to date the company has sold five times as many cars in Canada as during the same period last year.

METAL MARKETS

As in most other commodity markets, uncertainty is the outstanding characteristic of the market for steel products. It is well enough for producers to seek solace in the thought that the demand, while admittedly slight, has not gone to sleep altogether, and that the nominally prevailing quotations denote in the case of sheets an advance of approximately \$16 a ton over those of March, 1922, but these musings fail to shed any light on the all-important question whether the steel industry is or is not in for a much lessened pace during the year's second half. There are those who profess to see another buying movement in the making, while there are many more who admit that the outlook could not be more opaque.

It is interesting to note how the market reflects these conditions in spite of its strictly nominal character. There has been very little demand for semi-finished steel of late; producers, however, appear to sense the possibility of a moderate demand for sheet bars developing. So, as not to frighten consumers, they lower by a sort of tacit consent the price for sheet bars from \$45 to \$42.50. There has been no intimation on the part of consumers that they would enter the market at that level; in fact, the latter have been apathetic. If there were any real selling pressure, the market would be ragged, expressive of the competition between sellers; but, nominal as it is, it is uniformly \$2.50 a ton lower.

It remains to be seen whether amid the sheer weight of inertia the nominal quotations for finished steel products now prevailing will not undergo similar downward revision. There appears to be considerable satisfaction among producers that the cessation of the buying movement left prices in good shape. Undoubtedly they offer a much more satisfactory basis for the granting of concessions than would have those which obtained in March of last year, but altered conditions, a radical change in the ratio of demand to supply, invariably result in the discarding of an antiquated set of prices and the evolution of a new one. If a fresh buying movement crystallizes before autumn, it will naturally tend to restore to some actual value the present nominal quotations, although there are many who are of the opinion that to bring such a buying movement about it will be necessary first to revise these price levels downward. If such a buying movement is unduly belated, the nominal quotations of today will gradually lose all meaning. In a market in which the demand is subnormal steel is worth exactly what buyers will pay for it, producers then being compelled to bring costs down to harmonize with these conditions.

Pig Iron.—Buyers continue to have the strategic advantage over sellers, but, as usual amid such a state of affairs, the demand is very light. Quite a few automotive foundries overbought for second quarter delivery, and are now holding off. In general, however, it is the old, old story of consumers never buying in a declining market and falling all over themselves to get iron when prices shoot up.

Aluminum.—Odd sales of 98 to 99 per cent virgin aluminum ingots are reported to have been made recently in Detroit at around 26½ cents, the material consisting of semi-speculatively held resale lots.

Copper.—Domestic consumers continue to show an offish attitude, and producers are not pressing sales at the extremely low prices that prevail.

Calendar

SHOWS

Nov. 4-10—New York, First Automobile Exposition of the Foreign Automotive Association, Hotel Astor.
Nov. 11-17—New York, Annual Automobile Salon, Hotel Commodore.
Jan. 26-Feb. 2—Chicago, Annual Automobile Salon, Hotel Drake.

FOREIGN SHOWS

Berlin.....Sept. 28-Oct. 7
Automobile Show.
Oct. 4-14—Paris, Passenger Cars, Bicycles, Motor-

cycles and Accessories, Grand Palais.

Oct. 15-20—London, Motorcycle Show, Olympia.

Oct. 24-Nov. 2—Paris, Trucks, Agricultural Tractors, etc., Grand Palais.

Nov. 1-15—Buenos Aires, Annual Automobile Exposition, under the direction of the Automovil Club Argentino.

Nov. 2-10—London, Automobile Show, Olympia.

Nov. 22-Dec. 1—London, Motor Transport Exhibition.

Dec. 8-19—Brussels, Passenger Cars, Trucks, Airplanes

and Motor Boats, Aviation Palace.

RACES

Sept. 3—Annual Pikes Peak Hill Climb.

Oct. 28—Barcelona, Spain, Grand Prix for vehicles of 1500 c.c.; Nov. 1, International Grand Prix for cycle cars of 1100—Nov. 4, International Grand Prix for two liter.

CONVENTIONS

Oct. 24-26—Cleveland, Thirtieth Annual Convention of the National Association of

Farm Equipment Manufacturers, Hotel Statler.

Nov. 12-17—Chicago, Annual Business Exhibit and Convention of the Automotive Equipment Association, Coliseum.

S. A. E. MEETINGS

Oct. 25-26—Production Meeting of the S. A. E.—Cleveland.
Jan. 1924—Annual Meeting of the S. A. E.—Detroit.

MEETINGS

Sept. 19-21—Boston, Fall Meeting of the Motor and Accessory Manufacturers Association.

American Cars Take Japanese Army Tests

WASHINGTON, June 30—The annual motor trials conducted by the Imperial Japanese Army took place this year on two days in May. These tests, which are conducted by the Automobile Investigation Department, in cooperation with the Ordnance Department and officers detailed from the Motorized Artillery, Infantry and other corps, are held yearly for the purpose of determining the suitability of the various makes of cars and trucks sold in Japan for army use.

The authorities restricted entries in the 1923 trials to new models or cars that had not been entered in previous trials. For this reason the number competing was smaller than ever before, there being only seventeen entries in the passenger car class and seven in the truck class. This compares with twenty-five passenger cars and seventeen trucks in the 1922 trials.

American Units Used

Seven American cars, four German, three Japanese, two British and one Italian participated. The Japanese with one exception were assembled with American units. Truck entries were as follows: American, four; British, one; Italian, one; Spanish, one, and Japanese, one.

The first day's tests for passenger cars, which were to have consisted of acceleration, turning-radius, cooling, braking and other minor tests, were curtailed owing to the heavy rainfall throughout the day, and showed no outstanding developments.

On the second day there was a long road test for the purpose of testing performance and fuel consumption. The passenger car class covered a total distance of eighty-one miles; for approximately fifteen miles a speed of between 35 and 40 m.p.h. was maintained. The small light cars showed surprisingly good performance and were able to keep up without difficulty with the exception of the Fiat 505, which became overheated and had to withdraw. No other car had any difficulty.

On a fuel consumption basis, the light European cars came out ahead. The British B. S. A. and German Wanderer

averaged about thirty-three miles a gallon. The German Aga did not do so well. The American cars turned in totals which may be considered creditable, although nothing extraordinary. Among the larger cars, the German Mercedes and Protos did the best, but an American Six also did well.

In the truck class a run of sixty-three miles was made at a moderate speed, and none of the trucks, except the Japanese D. A. T., had any difficulty of any kind. The Italian Fiat and the Spanish Hispano-Suiza did best from a fuel consumption standpoint, but the British Thornycroft, the largest truck in the tests, made a very good showing considering its size.

The course adopted, both for passenger cars and trucks, was not in the least severe, and it is doubtful if tests of this character have any special value to the Army Automobile Investigation Department, beyond keeping the officers detailed to this duty fully conversant with modern automotive design.

Generally speaking, the points stressed by the Army buyers are not so much low fuel consumption, but rather power, accessibility, easy handling and sound construction.

RULES ON RACINE STOCKHOLDERS

RACINE, WIS., July 2—By a decision of the Federal Court of Appeals, owners of second preferred stock in the defunct Racine Auto Tire Co. will not be entitled to share in the proceeds of the liquidation. The company issued the shares largely for sale to employees on deferred installments and at the time it went into bankruptcy a total of \$120,000 was outstanding. The trustee opposed participation because the stock was sold without a permit under the "blue sky" law of Wisconsin.

TRAFFIC COURT PROFITABLE

NEW YORK, June 30—In the seven years the New York Traffic Court has been operating it has collected \$2,390,626 in fines and has heard 177,933 cases. Of these, 14,593 persons were unable to pay their fines. Straight jail sentences imposed were 4107; 168 licenses were revoked and 103 suspended.

Michigan Organizes Road Building Force

DETROIT, June 29.—The State of Michigan has begun the organization of a road building force capable of constructing 200 miles of highway a year, according to announcement by Governor Groesbeck, as a result of alleged collusion among road contractors in bidding upon State work. The charge of collusion grows out of bids on a Detroit-Lansing route which was to be let in three sections. Three contracting firms were each low on one section, but none low on more than one.

By forming the State road force, contractors will be obliged to bid against the State, Groesbeck says, and not only will have to meet State figures, but also to guarantee performance within time limits. There is no serious obstacle to the formation of such a road force, he states. By building 200 miles of concrete road a year, more would be built than has ever been the case under the contract system, he declares, and by the end of five years the State will have a real road system.

Urges Hard-Surfaced Roads

Nothing is more futile than attempting to build highways of gravel under present-day traffic conditions, the Governor says. Hard surface roads, alone, are adequate for needs, and while their first cost may be higher, they lower maintenance expense. Under the Federal aid plan with counties participating, the cost to the State of such road work would be about \$3,000,000 a year, or half the total cost. Under the contract system the State has been spending upward of \$10,000,000 a year.

CADILLAC TAKING INVENTORY

DETROIT, June 29—Cadillac Motor Car Co. is taking inventory this week and next while maintaining operations at about half the regular schedule. The inventory was skipped last winter because of extreme demand for cars, and is being taken now "on the run" because of continued heavy business. Following the inventory, operations will resume on full schedule.